ELECTRICAL SOUTH

SEPTEMBER
1945

52-In Hotel Type

58th SEASON

24-In "Airspred Ceiling

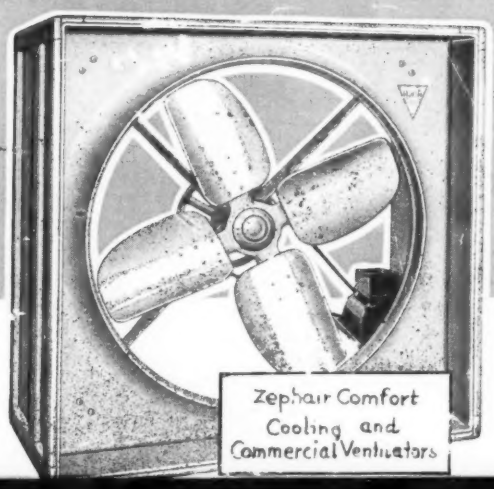
HUNTER, who has made fans and ventilators exclusively during 58 years, is now operating under War Production Board restrictions. • No more fans will be made except for the Army, Navy and Maritime Commission. HUNTER unfilled orders now on hand represent contracts with Government Agencies. • Certain sizes of belted exhaust types can be made available for Government hospitals and other war industries, subject to limited material inventories now on hand.

HUNTER FAN & VENTILATING COMPANY, INC.

Factory: FULTON, N. Y.

General Sales Offices: Memphis, Sterick Bldg. *Eastern Sales Office*: New York, 92 Warren Street *Western Sales Office*: St. Louis, 1706 Olive Street

Sales Offices:
ATLANTA
CHICAGO
DALLAS
HOUSTON
LOS ANGELES
PHILADELPHIA



Zephair Comfort Cooling and Commercial Ventilators

Sales Offices:
BOSTON
CLEVELAND
DETROIT
KANSAS CITY
NEW ORLEANS
PITTSBURGH

WESTINGHOUSE STARTS THE SPADEWORK FOR A BUMPER CROP OF POSTWAR SALES IN THE FERTILE RURAL MARKET

These two are typical of the full-page ads appearing regularly in
COUNTRY GENTLEMAN · FARM JOURNAL
PROGRESSIVE FARMER · ELECTRICITY ON THE FARM
A total readership in rural America of 22,440,000

esterday
TOMORROW..more and more farm folks will know
"There's a lift to living Electrically!"
"Gee, mom, remember how we used to have to scrub 'em?"
Westinghouse
Electric Ranges and Water Heaters

The farmer's in the bucks. Farm modernization is first in postwar plans. Electric power is a "must" for profitable farming. America's Rural Market is plenty fertile for a bumper crop of Electric Range and Home Freezer sales!

This spadework NOW will clinch volume sales for Westinghouse retailers. Dominating full-page ads appear consistently in four big rural magazines that blanket Rural America.

Get in on the harvest that's sure to follow this spadework. Ask your near-by Westinghouse Appliance Distributor for the complete story of the Westinghouse Full Line Franchise.

WESTINGHOUSE ELECTRIC CORPORATION
APPLIANCE DIVISION · MANSFIELD, OHIO
Plants in 25 Cities . . . Offices Everywhere

30 MILLION PRE-WAR
Westinghouse
ELECTRIC HOME APPLIANCES
YOUR PROMISE OF STILL FINER ONES TO COME

Tune in: John Charles Thomas, Sunday 2:30 EWT., NBC • Hear Ted Malone, Monday through Friday, 11:45 A.M. EWT., American Broadcasting Company Network

ELECTRICAL SOUTH is published monthly by W. R. C. Smith Publishing Co., Marietta, Ga., and Atlanta, Ga., U. S. A.
Subscription rates, United States and Possessions, $1.00 for one year; Canada, $1.50 per year; Foreign Countries, $2.00 per year.
Entered as second class matter at the postoffice, Marietta, Ga., under Act of March 3, 1879.
Volume 25 Number 9

Full production will need full power . . .

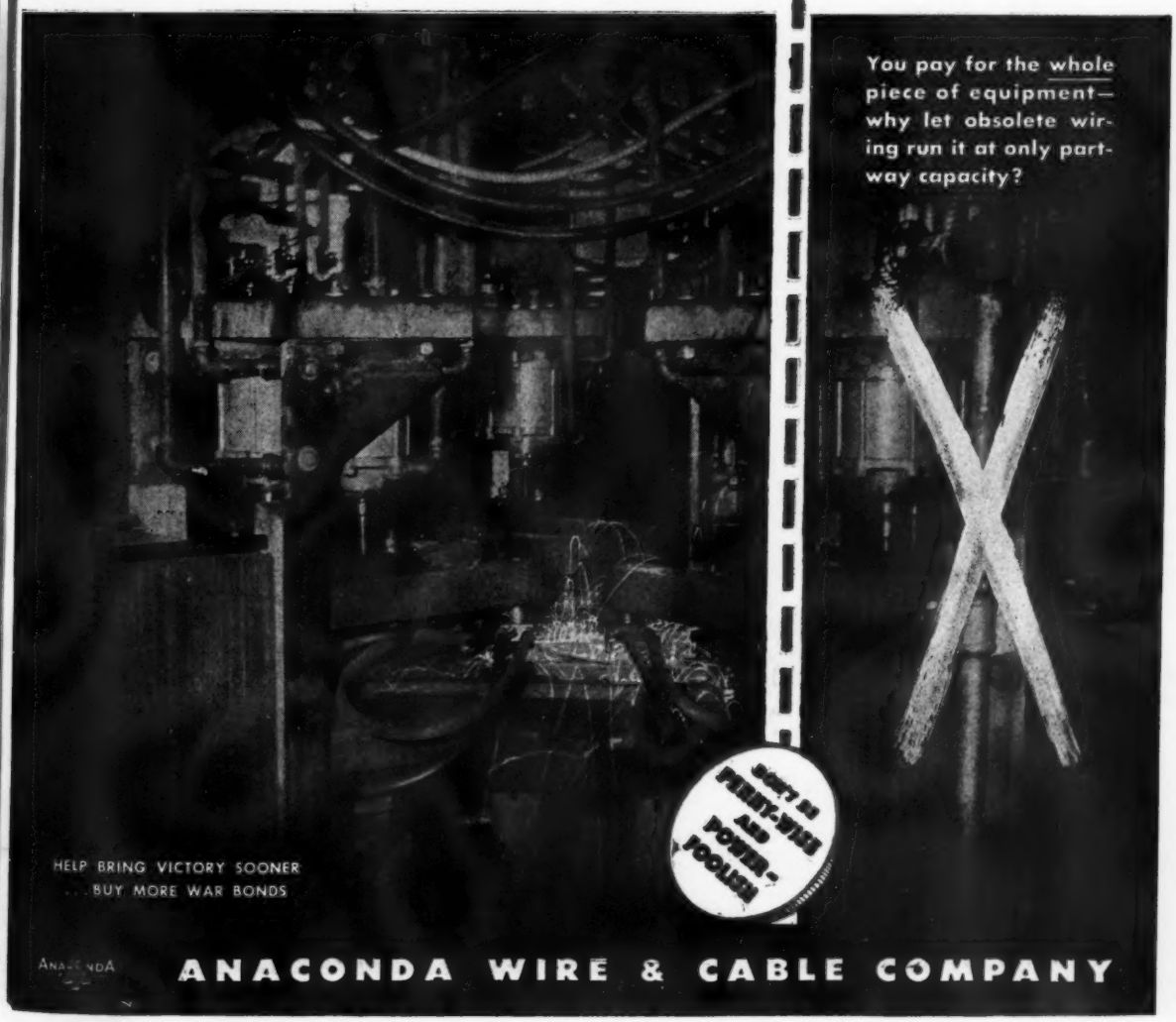
Wire ahead!

DO YOU KNOW how badly inadequate wiring can reduce the efficiency of advanced electrical equipment? From twenty-five to fifty per cent! Check your postwar plans now. Make sure wiring, service equipment, keep pace with your production hopes.

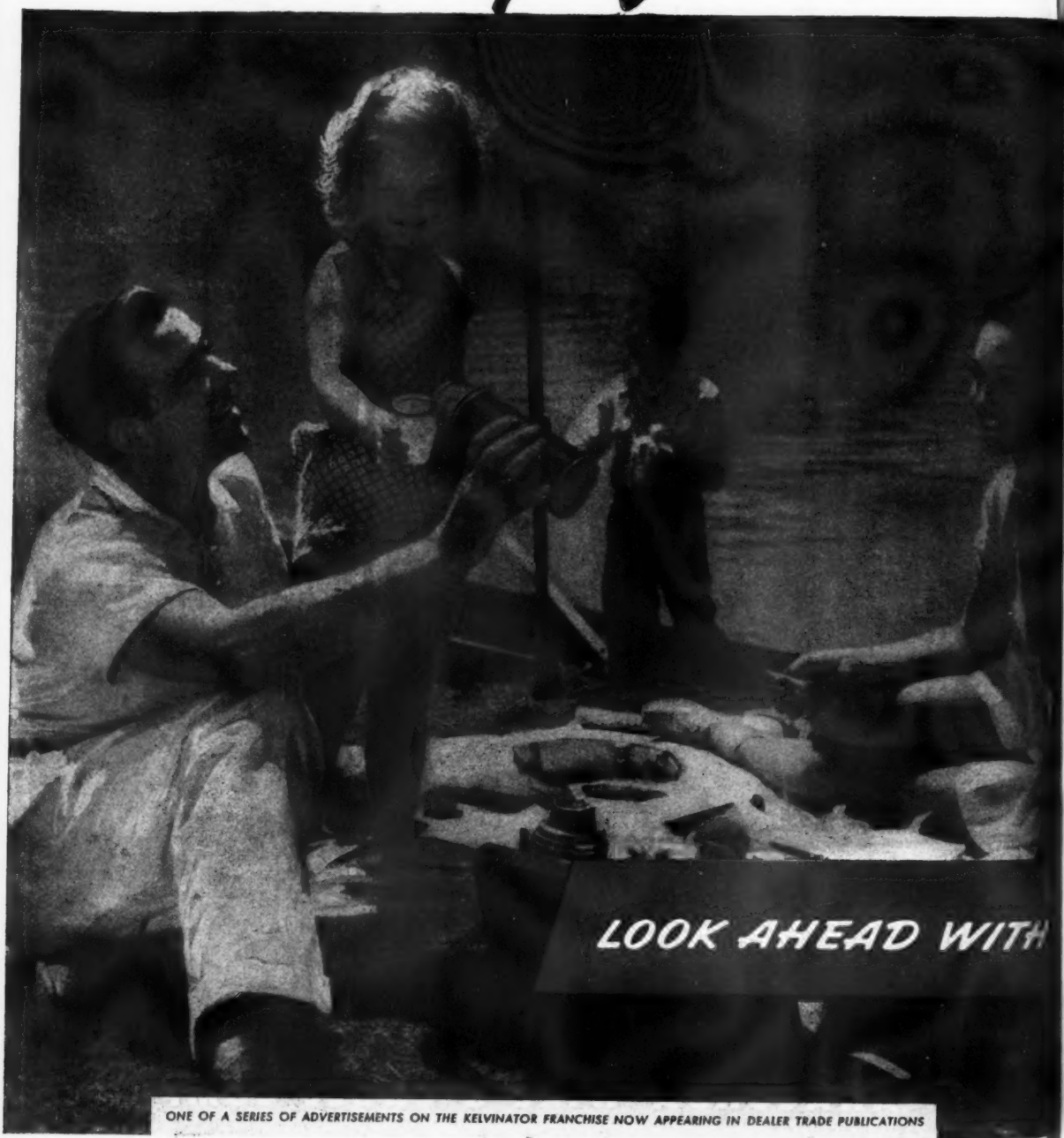
Wiring based on past standards won't do it. Wiring based on future power needs *will* do it. Certainly it will be a lot cheaper to change blueprints than face expensive alterations later.

Talk that over with your consulting or plant power engineer—your electrical contractor or power salesman. They'll confirm the logic of *foresighted* wiring in postwar plans. Anaconda Wire & Cable Company, Subsidiary of Anaconda Copper Mining Company. General Offices: 25 Broadway, New York City 4. Chicago Office: 20 North Wacker Drive 6. Sales Offices in Principal Cities.

Because of the basic importance of adequate wiring to the entire electrical industry, Anaconda is presenting messages like this in a wide list of national publications.


You pay for the whole piece of equipment—why let obsolete wiring run it at only part-way capacity?
HELP BRING VICTORY SOONER
BUY MORE WAR BONDS
ANACONDA WIRE & CABLE COMPANY

Not just a Living— a Way of Life!



ONE OF A SERIES OF ADVERTISEMENTS ON THE KELVINATOR FRANCHISE NOW APPEARING IN DEALER TRADE PUBLICATIONS

It's really what every man wants . . .

Not just a living . . . but *a way of life* that provides the opportunity for building a profitable, happy future.

The opportunity to have those things every man strives for . . . security for his family . . . the friendship and respect of his community . . . a deep personal faith in the future of his business.

Yes . . . add them all together and they total the things *you're* working for . . . things that come with sound, long-term personal planning.

And this is the reason the Kelvinator Franchise is so highly prized by the select group holding it. For Kelvinator believes in this kind of future for each of its Retailers . . . in a higher standard of business and human relations.

This thinking is the basis of Kelvinator's "Retail-Minded" policy that *no sale has been completed until the product leaves the Retailer's floor.* Kelvinator's entire sales program works to this end . . .

Selective Distribution Pattern—Kelvinator's retail organization is composed of not the most, but the finest Retailers . . . thus, with fewer Retailers, each with an adequate market, the result is more sales per dealer.

Less Inventory Investment—Kelvinator's line of products is so simplified and compact as to reduce Retailers' investments in inventory to the lowest. Each line is priced in accordance with Kelvinator's vigorous competitive policy . . . with salable values at each phase of Kelvinator's profit-building, step-up plan.

Point-of-Sale Power—Kelvinator's "Retail-Minded" merchandising means a complete program of advertising, sales promotion and sales training—sales building power aimed at one target . . . moving merchandise off the retailer's floor.

Yes . . . these are the reasons why Kelvinator means a personal business *future* for the Kelvinator Retailer . . .

Why the Kelvinator Franchise offers an opportunity to build the future every man wants!

The most Valuable Franchise in the Appliance Indust

RETAIL-MINDED

Kelvinator

DIVISION OF NASH-KELVINATOR CORPORATION

Kenosha · Milwaukee · DETROIT · Grand Rapids · Lansing

Tune in

SUNDAY ON N-K
Nash-Kelvinat
musical progra
days 4:30 P.M.
American Broa
Company.

READY NOW! G-E's Program for the

SEEING IS THE BIGGEST THING IN SELLING

Surveys that have been checked and rechecked prove that eight out of ten stores want new lighting. They want it fast . . . commercial lighting is your first, immediate opportunity for lighting profits. And a good lighting job can bring you not only initial profits but also a steady year-after-year lamp replacement business.

Ready for you now, to help you realize the fullest profits from lighting, is a complete General Electric program for the commercial lighting market—SEEING IS THE BIGGEST THING IN SELLING. Your G-E Lamp Representative will be glad to tell you all about it. Call him NOW—the sooner you see him the greater your competitive advantage will be.

Right now, G-E Lamp advertising in more than 40 trade publications, is telling prospective purchasers of lighting . . . everything from banks to beauty parlors . . . that SEEING IS THE BIGGEST THING IN SELLING. Get ready for your share of this big market without delay!

1. WHERE THE PROFITS ARE

2. HOW TO GET SET TO SELL

3. HOW TO GET THE ORDERS

G-E LAMPS

Commercial Lighting Market

In addition to more than a million stores that want to modernize their lighting, several hundred thousand new stores will be built as soon as materials are available. How do you go after your share of this business? Where do you make your profits? LIGHTING SALES AND SERVICE, General Electric's comprehensive and convincing new booklet, gives you the answers. The information in this booklet is the foundation for the whole campaign.

New light sources, such as General Electric SLIMLINE and CIRCLINE Fluorescent Lamps, are sure to be used extensively in commercial lighting. And commercial lighting sales will require use of new sales techniques. Even experienced lighting men will need to refresh their knowledge of lighting. The General Electric-La Salle Training Program for Store Lighting Salesmen will meet that need. It includes five texts, examinations, personal consultation service and a diploma.

In addition, G-E has prepared a pocket-size handbook, "The 3 A's of Store Lighting" for the lighting salesman to carry with him. It's a source of facts he'll refer to again and again.

To help the lighting salesman make a convincing and forceful demonstration, General Electric has prepared a visualizer that shows the merchant exactly what modern lighting can do in his store. Every page is designed to build up his receptiveness to good lighting, by letting him SEE what he's buying. To help clinch the sale there's another booklet to leave with the merchant, and a recommendation form to help the salesman make quick and accurate lighting recommendations.

All these sales aids will insure a complete and effective lighting sales job. Be sure to make full use of them . . . they'll help you close many a sale.

For complete details—See your G-E lamp representative!

GENERAL ELECTRIC

"MOST IMPORTANT"

An Oklahoma merchant who has used COMMERCIAL CREDIT SERVICE exclusively for eight years, says:

"We are most appreciative of the manner in which you have handled our transactions during the past eight and a half years. Your credit and collection services have been, and continue to be, far beyond our expectations. We especially appreciate your friendly attitude and your ever willingness to cooperate, not only with us, but with our customers as well . . . the latter being **MOST IMPORTANT** to any dealer.

"We unhesitatingly recommend the Commercial Credit Plan to all dealers."

M. E. O'BANNON CO.
TULSA, OKLAHOMA
AIR CONDITIONING AND REFRIGERATION

COMMERCIAL CREDIT PLAN

COMMERCIAL CREDIT COMPANY

BALTIMORE 2, MARYLAND

Capital and Surplus more than $65,000,000

World's Largest Electric Range Plant Swings Into Its Second Million Ranges

Section of range assembly line in world's largest electric range plant, now producing Hotpoint automatic electric ranges.

HOTPOINT ELECTRIC RANGE PRODUCTION RESUMED ON PEACETIME BASIS

NOW after four years of war work, the great Hotpoint electric range plant in Chicago is again in production on Hotpoint Electric Ranges.

In March, 1941, this factory turned out the millionth electric range since its invention by George A. Hughes. Of all major electric appliances, the electric range offers the greatest opportunity for increased sales volume. Millions of American families have said they want, and definitely will buy, electric ranges.

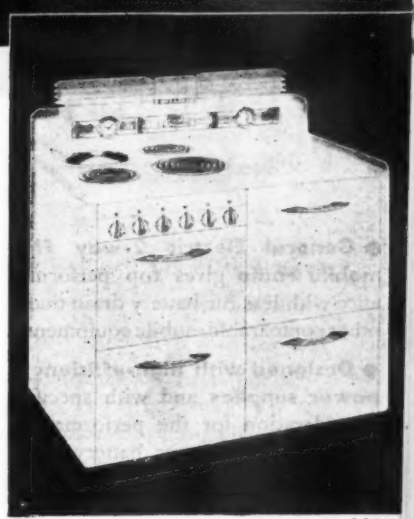
Leader in Electric Range Sales

Today Hotpoint is into its second million, with more than one-third of all electric ranges in use bearing the Hotpoint name.

As Hotpoint swings into full peacetime production, dealers operating under the Hotpoint Selective Dealer Franchise are in a preferred position to take advantage of future sales and profits. Hotpoint will bring to its selective dealers a complete line of full-size automatic electric ranges of typical Hotpoint high quality.

Edison General Electric Appliance Co., Inc.
5614 West Taylor Street, Chicago 44, Illinois

Dependability Assured by 40 Years of Experience



Hotpoint Model RC-

Hotpoint

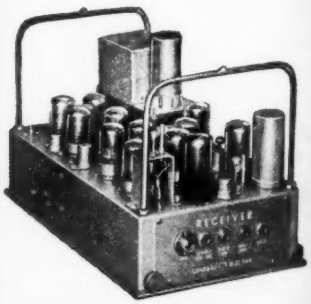
ELECTRIC RANGES

Electric Kitchens · Refrigerators · Home Freezers · Automatic Dishwashers · Garbage Disposalls · Electric Sinks · Cabinet Sinks Kitchen Cabinets · Clothes Washers · Electric Clothes Dryers Rotary Ironers · Flat Plate Ironers · Electric Water Heaters

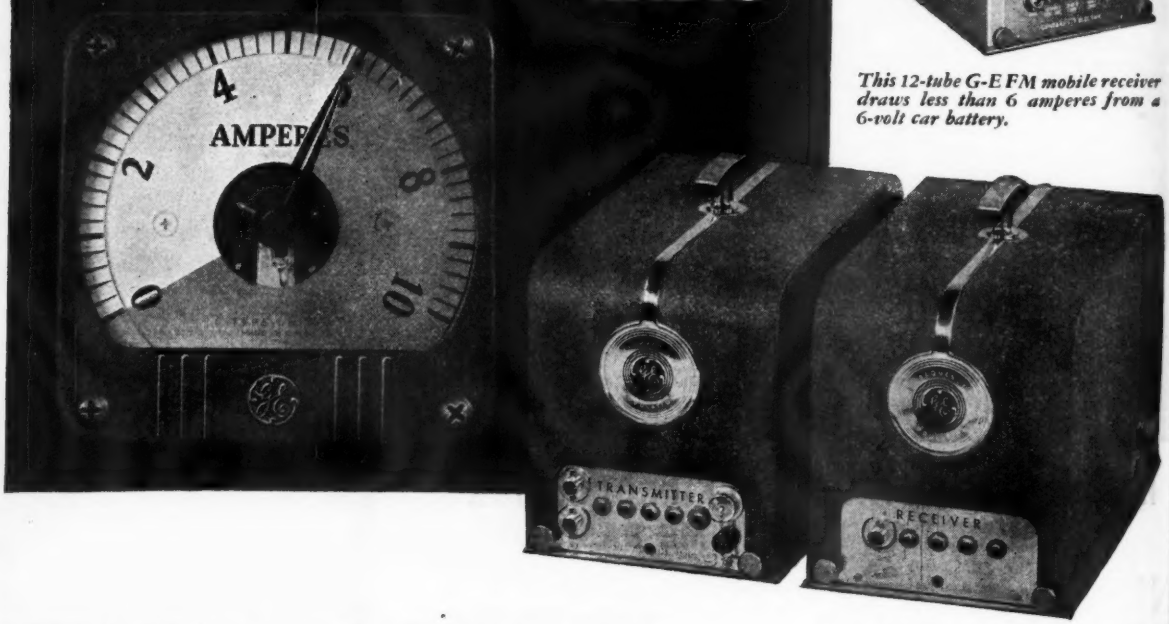
Lower battery drain

2-WAY FM MOBILE RADIO

- **Lower Battery Drain**
- **Greater Communication Range**
- **Improved Tuning Reliability**
- **Complete Accessibility**



This 12-tube G-E FM mobile receiver draws less than 6 amperes from a 6-volt car battery.



● **General Electric 2-way FM mobile radio** gives top performance with less car battery drain than other comparable mobile equipment!

● **Designed with high-efficiency power supplies** and with specific consideration for the performance limitations of the car battery, G-E 2-way FM mobile radio will keep any battery on the job longer and reduce over-all maintenance expense.

Compare these ratings:

UNIT	BATT. DRAIN
G-E mobile receiver.....	**5.9** Amp
G-E 30-watt mobile transmitter:	
Standby.....	**2.3** Amp
On-the-air.....	**31.0** Amp
G-E 60-watt mobile transmitter	
Standby.....	**3.1** Amp
On-the-air.....	**46.5** Amp

For additional information on G-E FM mobile radio equipment, or for help concerning your particular communication problem, see your G-E representative, or write: *Electronics Department, General Electric, Schenectady 5, New York.*

Hear the G-E radio programs: *"The World Today" News, Monday through Friday, 6:45 p. m., EWT, CBS. "The G-E All-Girl Orchestra," Sunday 10 p. m. EWT, NBC. "The G-E House Party," Monday through Friday, 4 p. m., EWT, CBS.*

Everything for a 2-way radio

GENERAL ELECTRIC

153-D7-5918

SPERO announces a NEW low-priced Commercial Fluorescent Luminaire

Here is the fixture your customers have been looking for — a low-cost glass shielded luminaire of smart appearance and high efficiency. Simplified design makes low-price possible without sacrificing quality.

SPERO CVG-448
—*glass shielded*

Made for four 40W tubes. *High efficiency* with low *intrinsic brightness* is achieved by panels of specially selected *"Claralite"* ribbed, ceramic-coated glass having 80% transmission factor and superior diffusing qualities. Reflecting surfaces finished in "Plastox" white. Glass is easily removed for cleaning or servicing lamps. New simplified method of installation for either stem or ceiling mounting. Attractive streamlined canopy furnished for stem mounting.

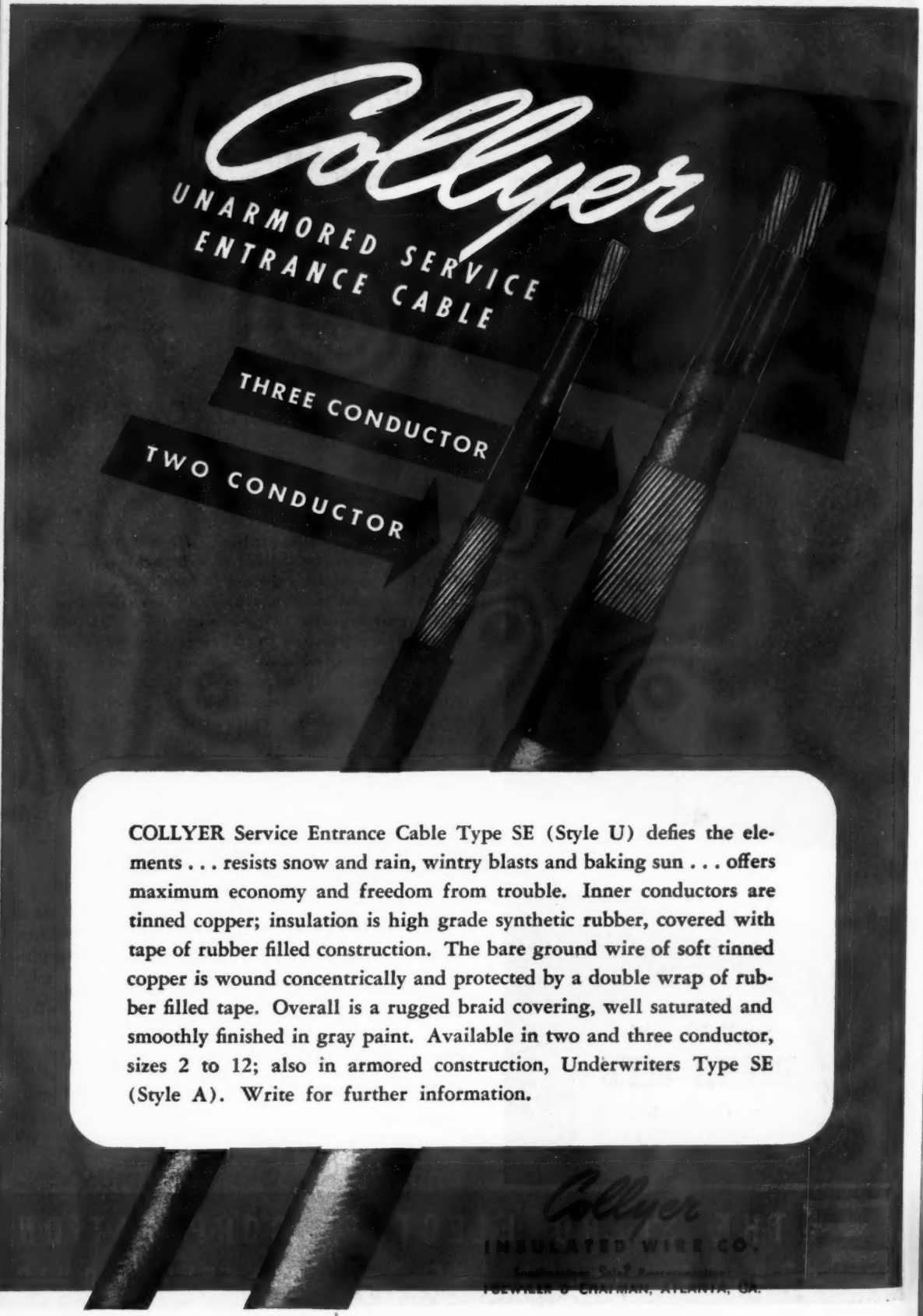
SPERO CV-448
—*unshielded*

The same fixture is designed for effective use without glass, where desired. Illustration at left shows that it is a highly attractive unit for any commercial or semi-commercial installation.

Spero INSTA-LITE, providing instantaneous starting, optional on both models at slight extra cost.

Write for descriptive bulletin.

THE SPERO ELECTRIC CORPORATION
18222 LANKEN AVE. ★ CLEVELAND, OHIO



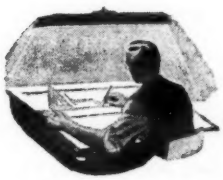
COLLYER Service Entrance Cable Type SE (Style U) defies the elements . . . resists snow and rain, wintry blasts and baking sun . . . offers maximum economy and freedom from trouble. Inner conductors are tinned copper; insulation is high grade synthetic rubber, covered with tape of rubber filled construction. The bare ground wire of soft tinned copper is wound concentrically and protected by a double wrap of rubber filled tape. Overall is a rugged braid covering, well saturated and smoothly finished in gray paint. Available in two and three conductor, sizes 2 to 12; also in armored construction, Underwriters Type SE (Style A). Write for further information.

Collyer
INSULATED WIRE CO.
Southeastern Sales Representatives
FLEWELLEN & CHAPMAN, ATLANTA, GA.

HERE'S ONLY A FEW OF THE IMPORTANT REASONS WHY THESE THREE PREFER G.E.

1. *Users* in stores, offices and factories prefer Watch Dogs because they eliminate annoying blink once and for all. Once the Watch Dog starter cuts out, blinking cannot possibly recur.

Lighting Engineers specify Watch Dogs because their precise construction provides unusually long life. The Watch Dog outlasts five ordinary starters. **2.**



3. *Maintenance Men* consider Watch Dogs as faithful helpers because these starters reduce lighting maintenance to the simple job of pushing a button before relamping. Simply re set it . . . forget it.

G-E Watch Dog Starters have been providing efficient and economical service for 30-, 40-, and 100-watt lamps in commercial and industrial lighting fixtures for several years. These manual reset starters have saved many manhours of maintenance. They've completely eliminated annoying blink of dying lamps. They have extended the life of fluorescent lamps with precision starting and positive stopping. Users of fluorescent lighting, engineers and maintenance men all over the nation are switching to G-E Watch Dog Starters, the preferred safeguards for fluorescent lighting.

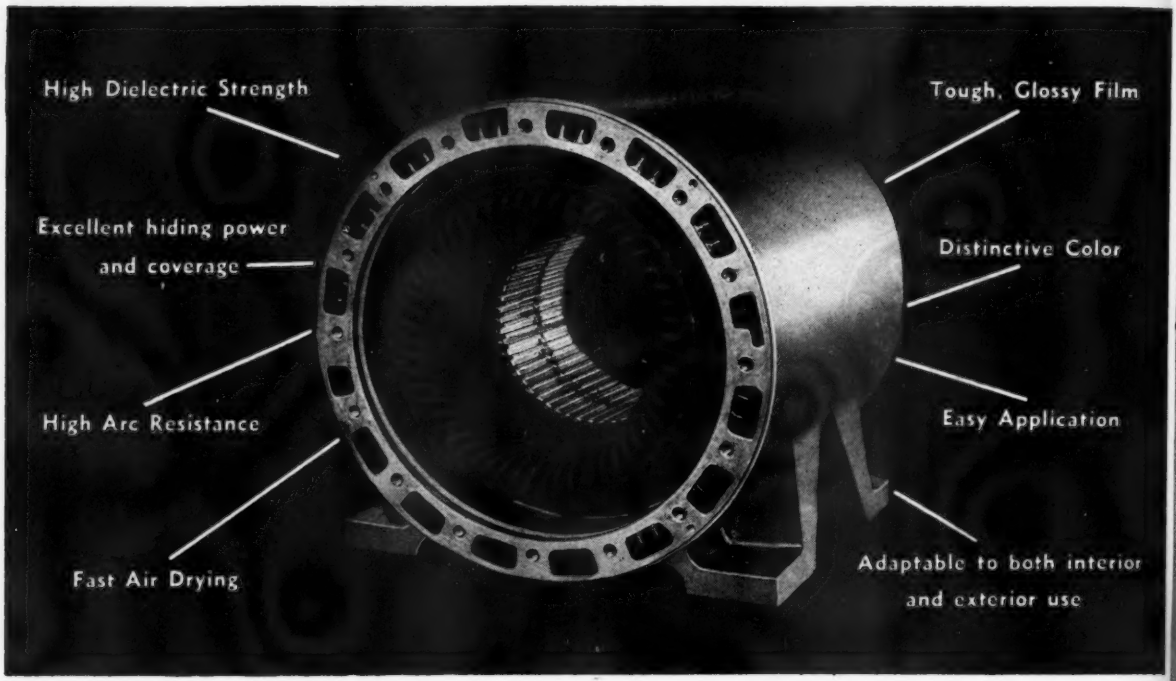
●

Get the complete story about G-E Watch Dogs by writing to Section G957-16, Appliance and Merchandise Dept., General Electric Co., Bridgeport, Conn.

BUY WAR BONDS AND KEEP THEM

GENERAL ELECTRIC

Protection DOLPH'S #10 RED INSULATOR



Illustration—Stator of Continental Electric Explosion-proof Motor

"WET DIELECTRIC UNCHANGED AFTER 3500 HOURS OF HEAT-AGING AT 275°F."

Yes, * SYNTHITE #10 Red Insulator was actually subjected to this severe test and passed it with "flying colors." SYNTHITE #10 Red Insulator was applied over two coats of clear baking varnish on a brass surface, and HEAT-AGED FOR 3500 HOURS AT 275°F. After this period, the test specimens were immersed in distilled water for 24 hours. The wet dielectric strength of the varnish after this treatment did not vary materially from the wet dielectric determined before the test, and the varnish film was in good condition.

Applied by brush or spraying over prevarnished surfaces, SYNTHITE #10 Red Insulator affords maximum protection against chemical fumes, oil, water, acids and alkalies. In fact, the chemical resistance of SYNTHITE #10 is so great that engineering departments of various industries such as paper mills, refineries, cement plants, copper mines, coal mines, quarries and steel mills, are using this enamel for protection against chemical fumes.

Insulating Dolph's Varnish Specialists

JOHN C. DOLPH COMPANY

168 EMMETT STREET • NEWARK 5, N. J.

* Reg. U. S. Pat. Off.

2-Way Help

for your relighting program...

OUTDOORS

City streets, highways, yards, buildings, play areas, farms, etc.

INDOORS

Plants, stores, offices, homes, institutions, etc.

Graybar's long-time cooperation in the field of "better light, better sight" is moving forward once more on two fronts. Both indoors and outdoors, Graybar Lighting Specialists are ready to help utilities, electrical contractors, builders, and operators of plants and commercial and institutional establishments, to raise the standards of lighting for greater safety, more efficient work, and more comfortable seeing.

Graybar's wide line of lighting fixtures and lamps — incandescent, fluorescent, mercury — is an important factor in facilitating the right choice of lighting for the job. Modern units distributed "via Graybar" stimulate the desire to relight.

In addition, Graybar Lighting Specialists will gladly work with you and your customers in planning modern lighting layouts. Just call the Graybar office near you. *Graybar Electric Company, Graybar Building, New York 17, N. Y.*

4566

IN OVER 80 PRINCIPAL CITIES

BULLDOG BUSTRIBUTION DUCT FOR "PLUG-IN" POWER AT ANY POINT

BullDog has been looking ahead for nearly half a century.

That is why industrial users expect from us one outstanding development after another in electrical distribution. That is why *proved* BullDog equipment will figure increasingly in the changeover plans of leading plants all over the country.

BullDog BUStribution Duct is the original "plug-in" system which gives you electrical power WHEREVER and WHENEVER you need it. Designed to stay modern, its pre-fabricated units can be re-assembled anywhere—new branch circuits added—feeder lines extended. It is 100% salvable, too—no fixed wiring to tear out.

It is not a day too soon to plan peacetime adjustments in your plant. Is your factory power system as *flexible* as your future plans may call for?

BUStribution Duct will take care of your wartime requirements as well as future ones. It will pay you to investigate. Write for illustrated bulletins or consult BullDog field engineers.

BUY WAR BONDS

SALVAGE PAPER

BULLDOG

ELECTRIC PRODUCTS COMPANY

BOX 177, R. PK. ANNEX, DETROIT 32, MICHIGAN. In Canada: BullDog Electric Products, Ltd., Toronto. Field Engineering Offices in All Principal Cities.

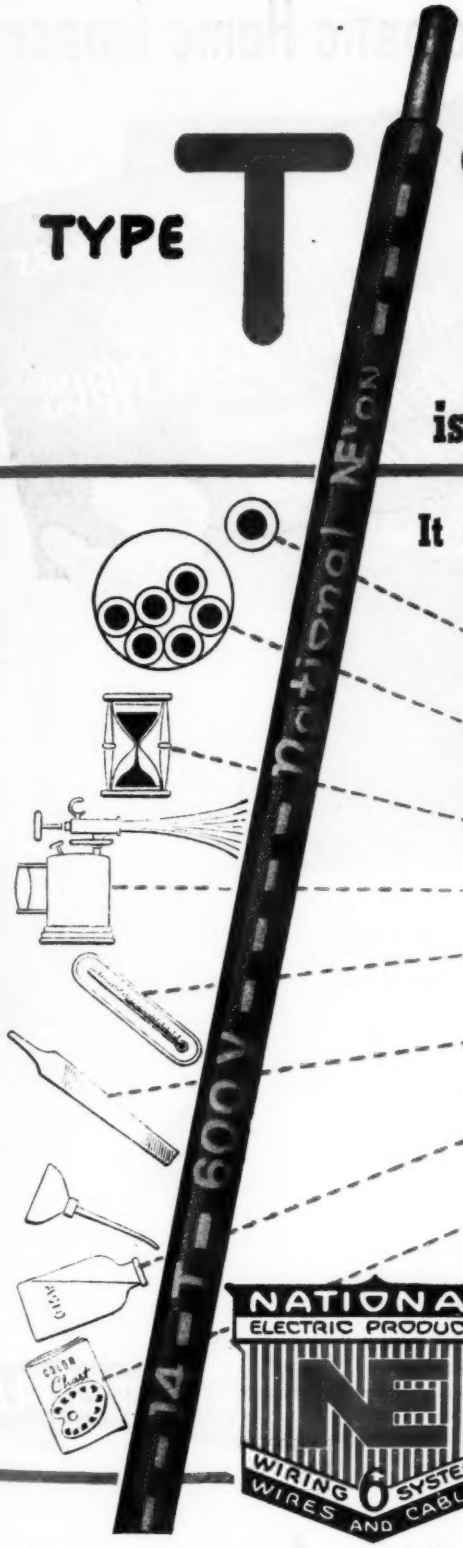
Also Manufacturers of

Vacu-Break Safety Switches—SafToFuse Panelboards—Switchboards—Circuit Master Breakers — BUStribution DUCT, for "plug-in" power—Industrial Trol-E-Duct, for movable "loads."

TYPE T NE`on

(thermo-plastic)

is a superior building wire (600 volts)



It offers these advantages over other types of electrical wiring:

- Superior dielectric properties, permitting minimum diameters.
- Greater number of Type T wires to the conduit, increasing wattage capacity as much as 212%.
- Better aging properties.
- Exceptional flame resistance.
- Approved for operating temperatures up to 60°C (140°F).
- Abrasion resistant—fibrous coverings unnecessary.
- High resistance to most acids and alkalies, alcohol, gasoline, oils and greases.
- Wide color range for easy identification. Permanent colors.

NATIONAL
ELECTRIC PRODUCTS
WIRING SYSTEMS
WIRES AND CABLES

Available in all standard sizes up to 2,000,000 CM. Sizes 14 to 4/0 are approved by Underwriters' Laboratories. And for unusually moist locations, specify National Electric Type TW. Engineering data on request.

National Electric
PRODUCTS CORPORATION
Pittsburgh 22, Pa.

Announcing the New BENDIX Automatic Home Ironer!

Note the unusually wide clearance between shoe and roll—the Bakelite work table—and the three accessible open ends of shoe and roll.

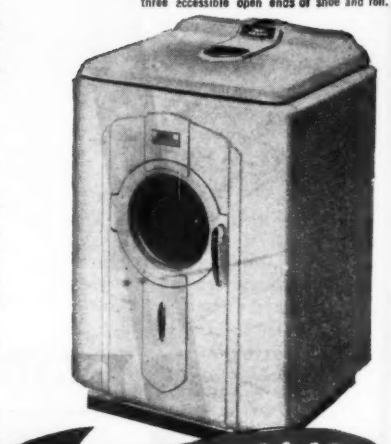
HERE it is—the new Bendix automatic Home Ironer. It's all you'd expect from the people who pioneered and perfected the marvelous Bendix automatic Home Laundry. And it's destined for an equally eager response from the public, because it is equally deserving of being preferred.

Three usable open "ends"! Here is the *only* ironer with three open "ends"—two usable open ends on the shoe, one on the roll. Usage is simplified, and the variety of garments it accommodates is actually multiplied. On *this* ironer, you can really iron a shirt or press a suit.

It's easier to Use! Unique under-the-roll shoe means greater flexibility; wider usefulness; simpler, speedier operation. Adjustable for both leg clearance and knee controls. Fits the operator—she doesn't have to cramp herself to fit the ironer. Series of features include dual thermostat controls, dual speeds, illuminated control indicators, perfectly placed Bakelite work table. "Learning how" is child's play. Usage is free from all needless effort or fatigue.

Perfect Visibility! Only with the under-the-roll shoe, can the operator see so well what she is doing. Additional advantages make visibility unequalled. At a touch, the correctly located shoe opens to a clearance of *four inches!* Controls for motor, heat and temperature are all illuminated. Everything is convenient to sight and touch.

Ninety-nine out of a hundred women say, "We want an ironer that's *easy to use—that irons everything!*" The Bendix is precisely that kind of an ironer. You'll want to see it—if for no other reason than to keep abreast of the best. Here it is—and it's a *Bendix!*



More women want to own the Bendix automatic Home Laundry, than any other "washer." Now you can team this washday miracle up with the one-and-only Bendix automatic Home Ironer—for double sales! For further information on the amazing new ironer, phone your distributer, or wire direct to Bendix Home Appliances, Inc., South Bend, Indiana.

BENDIX automatic Home Ironer

Bendix Home Appliances, Inc., South Bend, Indiana . . . Pioneers and Perfectors of the Automatic "Washer."

MAKE THIS LABEL THE HEART OF YOUR *Postwar Lighting Plans*

THIS IS A
Certified
FLEUR-O-LIER
LUMINAIRE
The Manufacturer guarantees by affixing this Label that this Luminaire is a duplicate of samples found by Electrical Testing Laboratories, Inc. in periodic tests of random samples to comply with the
SPECIFICATIONS OF THE FLEUR-O-LIER MANUFACTURERS
Electrical Testing Laboratories, Inc.
NEW YORK, N. Y.
CERTIFIED
ETL
THIS CERTIFICATION IS CONTINGENT UPON EMPLOYMENT OF CERTIFIED AUXILIARIES OF OVER 85% POWER FACTOR
* Certified Ballasts and Starters are an important part of Fleur-O-Lier Certification.

See how it protects you—

1. You get fixtures built to definite, authoritative specifications that mean the best in lighting performance and service.
2. You get fluorescent lighting fixtures that are subject to rigid test by Electrical Testing Laboratories, Inc., and Certified by them as meeting Fleur-O-Lier specifications.
3. You avail yourself of the knowledge and research of many of the finest technicians in fluorescent lighting.
4. You have more than 30 of the leading makers of fluorescent lighting fixtures as sources of supply. And this includes the biggest and oldest manufacturers in the business.
5. You can choose from a wide variety of fluorescent fixtures designed to fit the style needs of your store—*and be sure of top quality!*

*So when you plan for fluorescent lighting postwar, be sure that the fixtures you specify wear the famous Fleur-O-Lier label of Certification.**

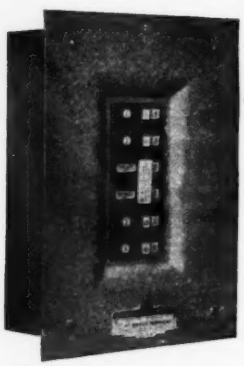
FLEUR-O-LIER *Manufacturers*

CERTIFIED FIXTURES FOR FLUORESCENT LIGHTING

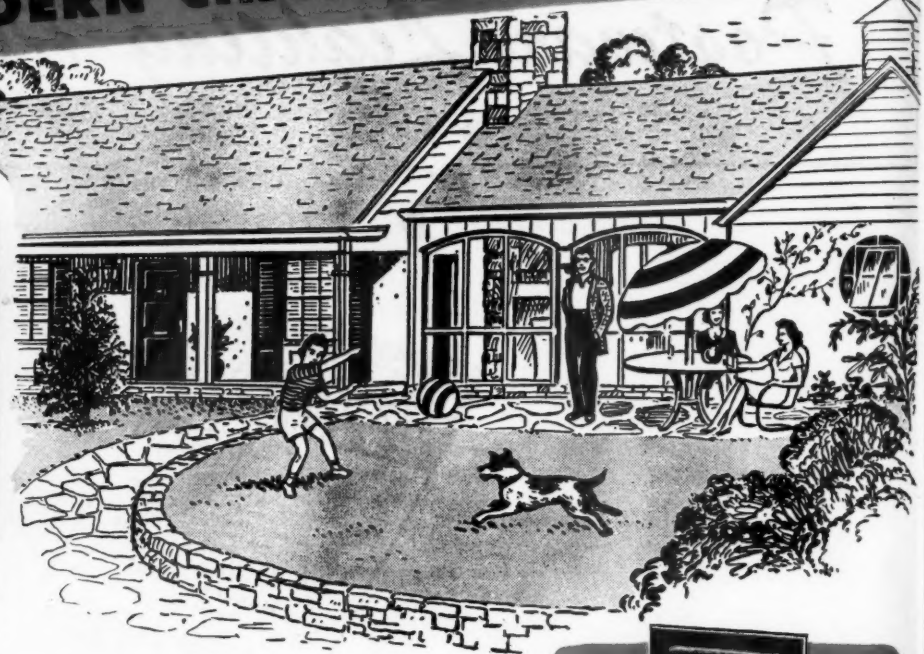
Participation in the FLEUR-O-LIER MANUFACTURERS' program is open to any manufacturer who complies with FLEUR-O-LIER requirements

A modern home needs...

MODERN CIRCUIT PROTECTION



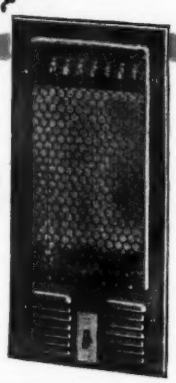
(FA) type AC circuit breaker Load Center with four single pole, and one double pole circuit breakers. List, $11.00. Maximum 16 poles.



HAPPY are the thousands of home owners who have (FA) type AC circuit breaker Load Centers or Service Equipment. To them, it means the finest in electrical protection and freedom from replacing blown fuses. A simple flip of the finger ... like on a light switch ... restores service instantly, when the cause of trouble is removed. That's important to women, and many men, too.

But more important, is the Thermal-Magnetic protection (FA) Load Centers provide. Automatic Thermal trip on overload plus Magnetic disconnect on short circuit is a double protection for wiring and electric appliances.

Here's a tip for you, Mr. Architect, and you Mr. Contractor: when you specify (FA) Load Centers include a few spare circuits for those electrical conveniences Mr. and Mrs. America are dreaming about now. The cost is little, but the favor is a big one. We'll be glad to give you complete details.



RETURNING SOON

The popular (FA) Quikheter. A built-in auxiliary, electric room heater that brings comfort and warmth to chilly rooms in just 3 minutes. No fan, or other moving parts to wear out, plus a Nichrome element that doesn't burn out. Priced as low as $30.00 list.

ESTABLISHED 1891 — THE SIGN OF A BETTER JOB

Frank Adam

LOAD CENTERS

FRANK ADAM ELECTRIC CO. ST. LOUIS, MO. U.S.A.

FRANK ADAM ELECTRIC CO., St. Louis — *Manufacturers of* Busduct, Panelboards, Switchboards and Enclosed Switches

Guth ALZAK Aluminum Lighting

T. M. REG. ALCOA

ALZAK (2-40w) FLUOFLECTORS arranged in continuous rows on 9'6" spacings, with 10'0" mounting, produce 32 to 35 Foot-Candles. Guth (2-20w) LOCAL FLUOFLECTORS over certain benches provide 110-125 Foot-Candles. Engineered by Mr. L. D. Lyon, Consumers Power Co., and sold by Electric Wholesale Supply Co., both of Jackson, Michigan.

ALZAK HIGHBAYS in large Pennsylvania warehouse. Spacings are 20'0" by 20'0", with 27'3" mounting-height. Alternate units utilize 400w Mercury-Vapor, and 750w Incandescent to produce 20 Foot-Candles of uniform illumination. Engineered by owner's Electrical Department; sold by Kingsport Electric Co., Kingsport, Tenn.

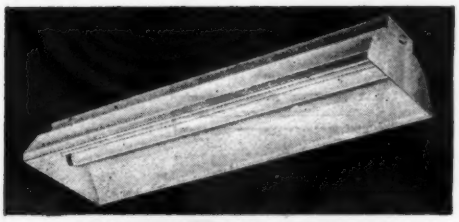
SUPER-PUNCH "Light-Kick" REFLECTORS

FOR FLUORESCENT AND INCANDESCENT LAMPS

For Light-Control, Efficiency, Punch and Permanence, Guth ALZAK Aluminum reflectors are top-quality. They are processed ALZAK in the Guth Co's. own plant, under quality-controlled supervision.

Engineered reflector contour is omnipotent (where ALZAK reflectors are concerned). Then the Guth ALZAK process electrolytically brightens the formed Aluminum metal for high efficiency; finally, it permanently seals in this efficiency with an aluminum-oxide coating that is *second in hardness only to the diamond!*

Yes, a Guth ALZAK Reflector is a *good, efficient, tough Reflector!*



ALZAK FLUOFLECTOR

T. M. REG.

ALZAK reflectors "control" and "direct" the Fluorescent light rays to the *useful* working-plane. FLUOFLECTORS are available in Open-End and Closed-End types. For individual or continuous-row layouts. Sizes are: 2-40, 3-40 and 2-100 watt. Eggcrate Louvres available for added lamp-shielding, where desired.

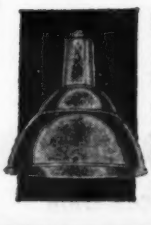
YORK ALZAK INDIRECTS using 750w, T-24, Bipost lamps on 9'0" by 10'0" spacings, 11'7" ceiling-height, 8'7" mounting-height, provide 50 Foot-Candles of uniform lighting. Complete absence of glare despite horizontal positioning of drafting table tops. Sold by Wipperman-Mitchell Co., Buffalo, N. Y. See I.E.S. Data Sheet 13-19 for further details.

ALZAK (2-40w) FLUOFLECTORS with Eggcrate Louvres, are arranged in "45° Angle-Spacing" on 6'0" centers, with 9'6" mounting. There are 74 Foot-Candles on the drafting tables (not 1 Foot-Candle variation); the "45° Angle-Spacing" provides "close to shadowless lighting", a remarkable achievement with Direct-Shielded form of lighting. Sold by Eoff Electric Co., Portland, Oregon.

GUTH SURGERY-LITE

T. M REG.

Spectacular photo above, shows intense light-beam (directed via Guth ALZAK control) piercing a dark haze. Only a small 100-watt Incandescent lamp bulb (1340 Lumens) is used, yet more than 2000 Foot-Candles are developed on the operating table (48" beneath the fixture), with over 1000 Foot-Candles (average) over a 6" circle.



GUTH HIGH-BAYS

ALZAK light-control is the most efficient, least expensive method for effective lighting of high-bay areas (25'0" or higher). Guth lists 3 types (30°, 60°, and 90° beams), and each type in 2 sizes (300-500w and 400w (Mercury) or 750-1500w).

YORK INDIRECTS

Super efficient, nicest looking incandescent-indirect we ever produced. "Light-spill" softly illuminates YORK'S exterior, which blends the luminaire in with the lighted ceiling. Made in 3 sizes, for 200 to 1500 watt lamps.

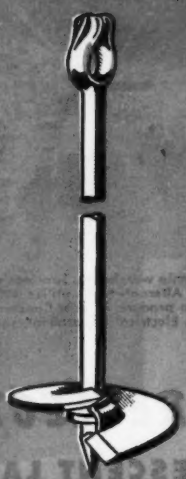
Leaders in Lighting Since 1902

Guth

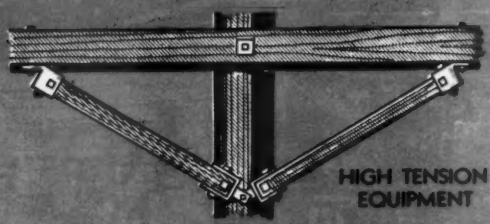
THE EDWIN F. GUTH COMPANY • 2615 Washington Ave. • St. Louis 3, Missouri

1945 CONSTRUCTION

"Hang the Load on Hubbard Hardware!"



STEELWING ANCHORS
2-3/4" to 10" Diam.
1-1/2 Ft. to 8 Ft. Lengths

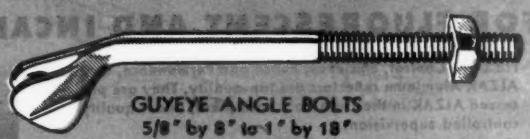


HIGH TENSION EQUIPMENT

WOOD BRACES
All Sizes—Many Types

CROSSARM BRACES
Flat, Ribbed, One Piece, Wood and Steel

PINS
All Sizes
and Styles

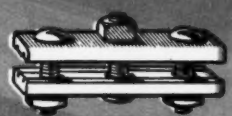


GUYEYE ANGLE BOLTS
5/8" by 8" to 1" by 18"

LAG SCREWS
All Standard Sizes

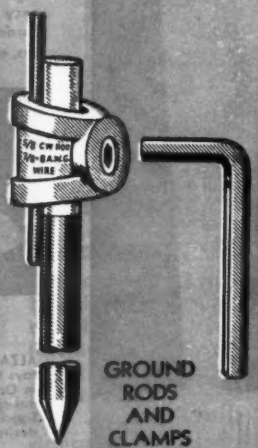
CARRIAGE BOLTS
All Standard Sizes

CROSSARM & MACHINE BOLTS
3/8" by 1" to 3/4" by 28" Sizes



GUY CLAMPS
1-2-3-4 Bolt Sizes

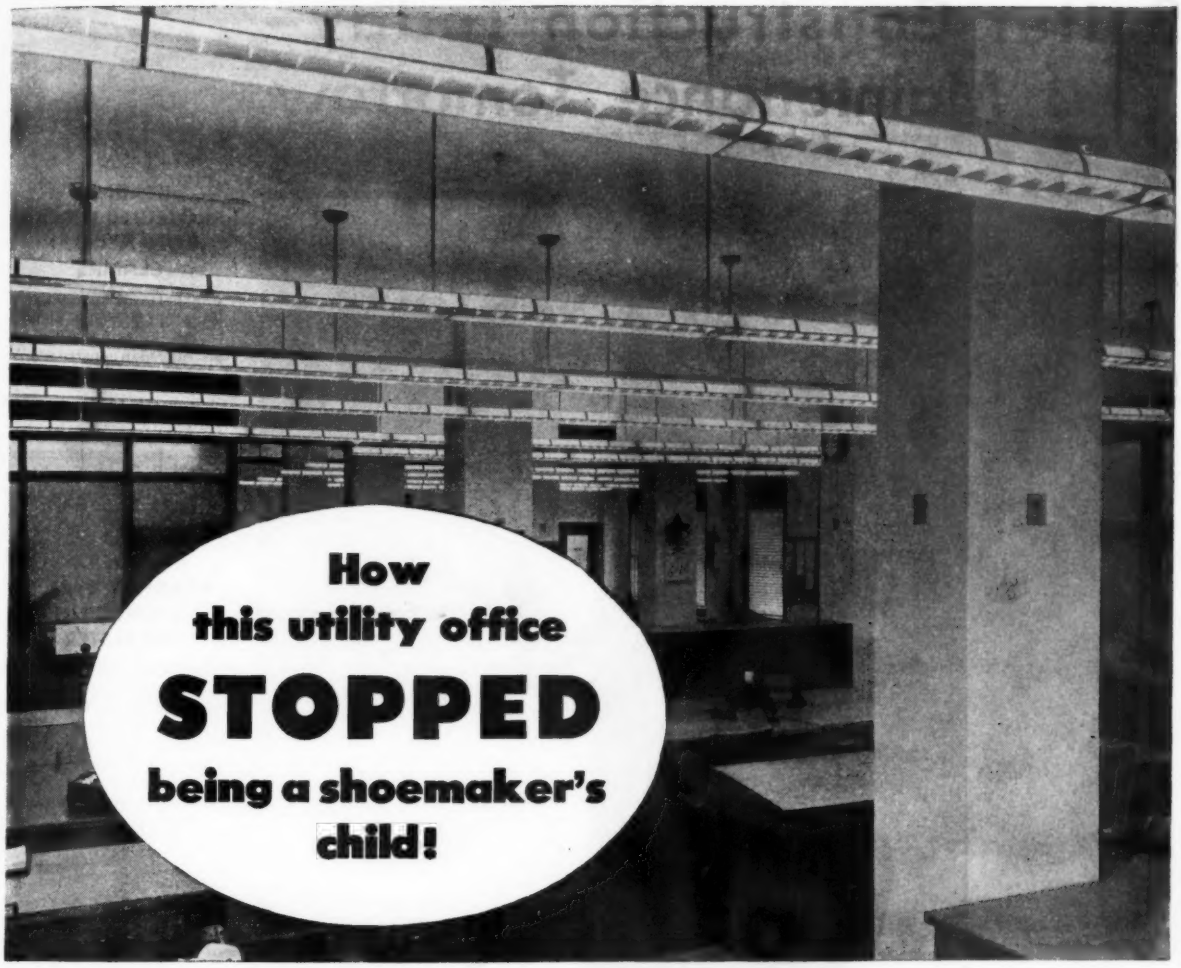
EYE NUTS
All Sizes
and Styles



GROUND RODS AND CLAMPS
Hubbard-Copperweld

HUBBARD AND COMPANY

Pittsburgh • Chicago • Oakland, California



Wanted:

An office lighting installation to set a standard for other companies on Tampa Electric's lines—and incidentally to help on its own paper work.

Problem:

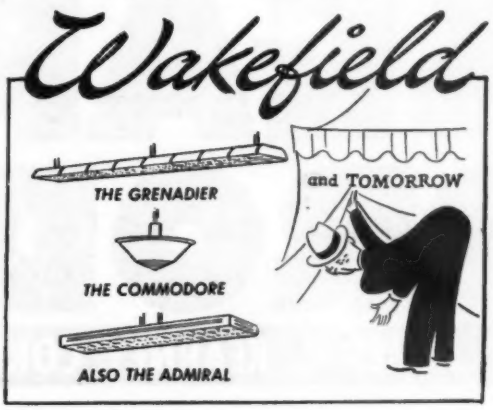
High quality, high level illumination . . . lighting as modern as the air conditioning then being installed.

Solution:

Tampa Electric chose continuous rows of Wakefield GRENADIERS (No. PG-2488) to provide plenty of cool light on desktops and diffused overall light throughout the room. They realized the importance of proper light on walls and ceiling, since this means less strain on eyes and a pleasanter place to work.

In this 40′ x 80′ room of the accounting department, 98 units were used in rows 7′ 9″ apart and 11′ above the floor (ceiling height 14′). Result: an average of 45 footcandles four months after installation.

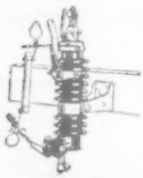
Perhaps your offices or some of your customers' offices call for a different lighting treatment, different fixtures. You can be sure that Wakefield has the answer . . . and will be glad to work with you for engineered lighting performance. The F. W. Wakefield Brass Company, Vermilion, Ohio.



Better Construction Today–
Less Maintenance Tomorrow

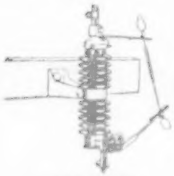
KEARNEY PROTECTED THREAD CON-NEC-TAP CLAMPS

For better line connections that stay tight under severe vibration. Light, yet rugged in construction —resistant to corrosion.



KEARNEY TYPE T LIGHTNING ARRESTER

Assures continuity of service — low-cost lightning protection. Lightning charge is diverted to the ground quickly, line-to-ground current is limited to ½ cycle or less. Pole, cross-arm, or transformer mounting.



KEARNEY TRIP-O-LINK FUSE CUTOUT

A practical cutout that provides dependable protection at low cost. Tight, clean contacts and positive link separation are assured when a fault occurs.

KEARNEY PRODUCTS

MADE BY **JAMES R. KEARNEY CORPORATION** 4236 CLAYTON AVENUE SAINT LOUIS 10, MISSOURI

ELECTRICAL SOUTH

VOL. 25 SEPTEMBER 1945 NO. 9

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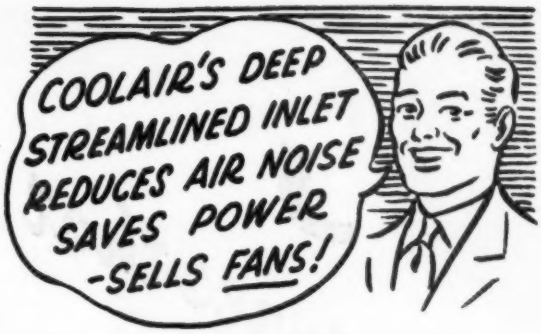


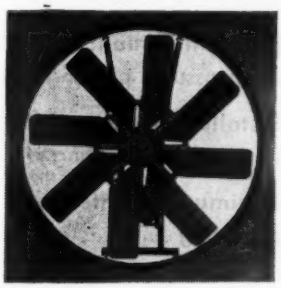
"Yes, Sir! It's easy to get your prospect to sign on the dotted line for Coolair fans, after you point out and explain the quality features to him.

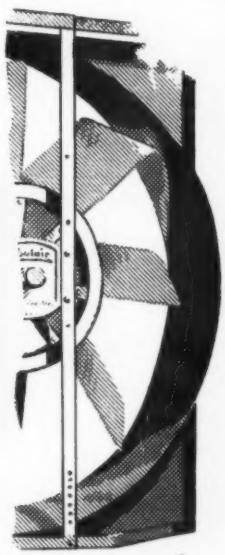
"And you know he is pretty well sold when he is willing to wait a while for delivery on a Coolair even when your competitor may be able to offer him another make of fan right off the floor.

"That deep streamlined inlet . . . it not only greatly reduces air noise, but saves plenty of power by preventing spill-off of air at the end of the fan blades.

"And as I said . . . it's quality features like these, built into Coolair fans, that keep my customers satisfied . . . they are the best fan salesmen I've got!"

Coolair
TRADE MARK





RIGHT: Sketch of portion of Coolair's welded steel frame showing deep curved inlet that reduces air noise, saves power, prevents air spilling off blade ends.

A full description of the Coolair line, with tables showing models, dimensions, performance data, etc., can be found in SWEET'S CATALOG A.S.H.V.E. GUIDE ELECTRICAL BUYER'S REFERENCE

AMERICAN COOLAIR CORPORATION...Manufacturers

3604 MAYFLOWER STREET

JACKSONVILLE 3, FLORIDA

5 Features that CLINCH SALES

The Curtis SKYLUX

- **Simple Beauty** in functional design makes the SkyLux one of the most attractive units on the market.
- **Shielded Lamps** achieve a careful compromise in concealing the lamp from the eye at normal viewing angles without sacrifice of light delivery.
- **High Utilization:** 90% of light output is downward and the Fluracite finish assures prolonged high efficiency.
- **Installation Adaptability** permits pendant or ceiling, individual or continuous-line mounting at low installation cost.
- **Minimum Maintenance** of reflecting surfaces because horizontal dust collecting surfaces are eliminated in design.

Your selling story will be appreciably strengthened by all the technical details and sales facts we have available on SkyLux. Write today for our four-page bulletin.

CURTIS Lighting, INC.

6135 WEST 65TH STREET, CHICAGO 38, ILLINOIS

Lighting a Bright New World

THE WAR IS OVER! From the manufacture of radar, assault wire, machine guns, and other weapons, the electrical industry turns again to the making of peacetime products — washing machines and ranges, lamps and fixtures, and the thousands of other items that this industry has developed to aid business and to make the home more livable.

The outlook for all branches of the electrical industry is a cheerful one; for the lighting industry it is exceptionally good. Lighting postwar America presents vast opportunities. The commercial lighting market alone, as H. H. Green reports in his article beginning on page 26 of this issue, has a potential of more than 250 million dollars annually, and will require the selling and installation of some 6,000,000 lighting fixtures.

In addition, it is reported that 85 per cent of our old industrial areas are inadequately lighted according to present-day standards. Edison Electric Institute estimates that three billion square feet of industrial areas are inadequately illuminated. And added to all of this is the task of providing better lighting for the millions of new homes to be built in the next few years.

When will the upswing occur? The war's sudden end may find the industry without the orderly reconversion plans that might, otherwise, have been expected. But this should not affect the lighting industry as much as it will some others. As W. A. Feuillan, Jr., Regional Vice-President of the Illuminating Engineering Society, has so well expressed it in his article on page 30, "Lighting should be one of the businesses first to revive and react to the postwar plans and needs of commerce. It offers quick, easy, and inexpensive modernization for stores, shops, and offices. Already, and all around us, there is evidence that owners won't wait. They are 'jumping the gun' as WPB releases materials. So the alert wholesaler, dealer and contractor will prepare now to share in the greatest lighting market ever."

With this modern front, planned lighting works night and day to successfully compete with the brilliance and color of street and sign lighting, to do a three-second job of stopping passersby and inviting them to enter. Distributors and their salesmen, if they are to sell modern lighting at its best, will sell not fixtures but the many benefits that correctly engineered lighting installations bring their commercial customers.

Modern Lighting—
DOUBLE-DUTY SALESMAN

By H. H. Green
General Electric Co.
Nela Park, Cleveland

EVERYONE in the electrical fraternity has tried to measure the intense and widespread interest in postwar modernization, has attempted to evaluate what this will mean in terms of service and profit. Utility men, contractors, wholesalers, and dealers are making their respective plans to serve a new and unprecedented market for every type of electrical equipment. As they consider the problems, obligations, the opportunities, that lie ahead, a new salesman stands ready to serve them, to help them capitalize on a most important part of their commercial market. This salesman is modern commercial lighting.

At one time this salesman can serve two groups, help to move an unprecedented volume of lamps and fixtures for the electrical contractor and wholesaler, stepping up sales and service for retail merchants. In each of these important jobs, this versatile salesman, trained under pressure in war industry, will bring both extensive experience and a wide range of new techniques to the service of electrical distributor and retail merchant.

Vast Market Waiting

The experts who have studied and analyzed this new market assert that it will involve the selling and installation of 6,000,000 lighting fixtures, that it will take not less than five years to complete the job, that the potential will total 250 million dollars annually, that the contractor, wholesaler or dealer can figure his local potential at $2,000 per thousand population in his local territory. And these figures include the estimated demand for overhead fixtures alone.

In addition, analyists of the commercial lighting market tell us, there is at least an equal volume of potential business to be had from other sources. These include: supplementary lighting equipment, modernization of wiring systems, fixture installation, lighting maintenance and replacement.

The market that electrical equipment salesmen will serve postwar is not only astoundingly larger in potential, but it is different in character and broader in the services and benefits that better lamps will bring their

users. In addition to lamps for light, heat lamps and germicidal lamps will have an increased public acceptance and usefulness. Infrared lamps for many heating, drying, finishing, as well as supplementary home uses, will help to build the postwar potential. Germicidal installations, in stores, hospitals, schools, public buildings, theaters, and every other place where people congregate, will further expand the contractor and salesman's opportunity for increased sales volume and productive goodwill.

War Stimulated Progress

War has immeasurably stimulated lighting progress. Lighting engineers, lighting specialists and consultants, all the men and women who have been principals in applying light for better sight in home and industry, have long since advanced beyond a mere public acceptance of adequate artificial lighting. Today, old standards are gone. Tomorrow, in store and factory, school and home, the public will demand, and electrical sales and service men will supply, much more than just more light.

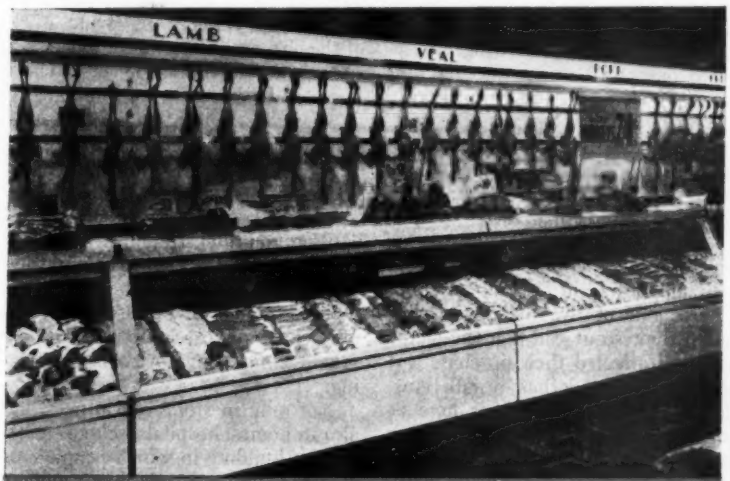
The merchant will want light for modernization, new atmosphere, increased sales. The industrialist has learned from war experience that modern lighting can speed production and lessen accidents. Educators have long deplored inadequate lighting in the schoolroom, and backed by light-conscious patrons and school boards, they will insist on the higher lighting levels that will assure more satisfactory progress in classwork, more healthful, happier pupils in postwar schoolrooms. The home owner will want more tasteful efficient lighting for greater comfort, beauty and utility.

Both those who sell and those who buy lighting equipment realize that we face a brighter tomorrow. Three-shift, round-the-clock production for war has forced a general recognition of the importance, and an appreciation of the expanded services, of modern lighting. Solving seeing problems in war industry gave lighting engineers new opportunity to strike out with new impetus and imagination, to use higher levels and to introduce new refinements of illumination. Large numbers of people, never before employed in industry, have been educated to advanced lighting standards under the high level illumination of war plants. They have a new understanding of what light can do to make their work more efficient, their shopping more satisfactory, their recreation more pleasing.

Everything that has been accomplished in lighting since the development of the tungsten-filament lamp is evolutionary, while the promise of the future is revolutionary. Readers of ELECTRICAL SOUTH are familiar with many of the figures that measure the demand for fluorescent lighting. They know that 8 out of 10 store owners are planning to relight. A recent General Electric survey revealed not only important facts and figures about fluorescent in stores, but also significant reactions of retailers who installed fluorescent prior to 1944. Also sampled was the opinion of their neighbors, who had seen the new light in operation.

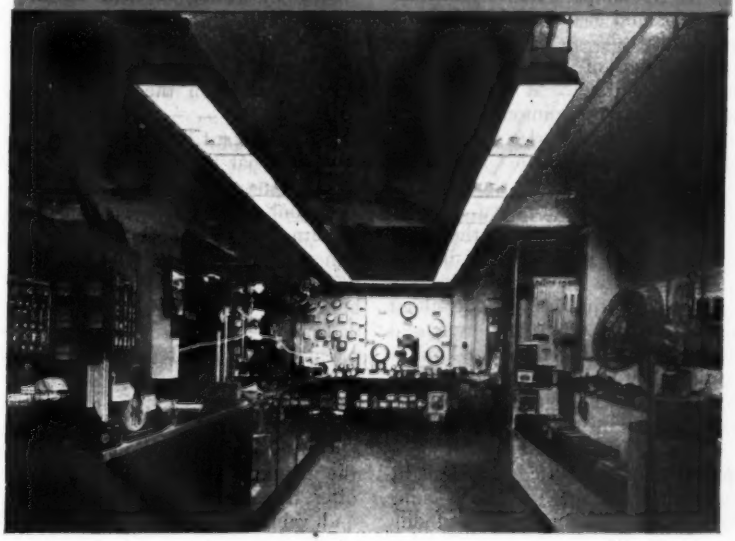
A resume of some of the findings of this study of their best postwar market may serve to remind electrical supply salesmen of some of the problems as well as opportunities ahead.

Almost nine out of ten of the retailers who installed fluorescent said that they liked it, that they would



Those who sell lighting to retail stores as a means of modernization and a stimulus to merchandising will find many locations in which the new tools and techniques can contribute to better seeing and selling. In this food store interior, continuous fluorescent installations serve to bring section signs into clear contrast, silhouette displays in the meat department, provide cooler, more effective lighting for refrigerator cases.

As a double duty salesman, modern lighting sells lamps and luminaires for the wholesaler and contractor, sells extra merchandise for the retailer in every type of store. This electrical interior illustrates the use of general industrial illumination to demonstrate lamps and luminaires as well as increase customer circulation and provide harmonious atmosphere. Almost nine out of ten of the retailers who have already installed fluorescent like it.



recommend it to their friends. Virtually every merchant interviewed reported that he was getting higher lighting intensities than he had previously gotten with filament lamps. Among the small number who were not satisfied with the quality of the fluorescent they had installed, merchants complained principally of poor equipment and color distortion.

What Dealers Say

Before buying, more than half these merchants were influenced by some phase of cost, and in the opinion of those doing the interviewing, more than 8 out of 10 were undersold. A significant trend, in the first fluorescent installations is seen in the fact that, in changing from filament to fluorescent, almost 70% installed less kilowatts. A relatively small number of these realized that their lighting was inadequate, and said that they were planning to install higher levels when supplies again became available.

Three out of five merchants who bought fluorescent said that the factor that most affected their purchase was the influence of other installations. There is very clear evidence here of the importance of model lighting demonstrations. Less than half of these change-overs were made without a planned layout. However, three out of four said that before purchasing additional equipment they would seek competent advice.

Almost half of those who changed from filament to fluorescent merely substituted fixture for fixture, with only one-third installing a greater number of fixtures than they had used previously. Exposed lamps were used in four out of five interiors, and suspended fixtures were used in more than three out of four stores. An average of 44 lamps were installed in each store and 7 out of 10 of these were 40 watts.

A number of neighboring merchants were interviewed to determine their attitudes and opinions. Of these, more than 6 out of 10 were favorably impressed with the new light source and said that they would change to fluorescent when supplies were again available. That these initial fluorescent installations failed to demonstrate this new lamp at its best is indicated by the fact that only about one out of four of the non-users said that they would use the same kind of lighting they had seen in neighboring stores. Even a larger number said they would want a different type.

Some of these postwar prospects appear to have profited by the lighting mistakes of their neighbors, since one-third want more light and only one in five reported that they would be satisfied with the same amount.

Office Lighting Survey

In a similar study of the office lighting field, a smaller number of office men than retailers considered cost as the deciding factor. The majority were most influenced by a desire for better lighting. Cost was in second place, with more modern lighting, less heat, and employee benefits following in this order. Tenants initiated 54% of the changes from filament to fluorescent, while 47% of the changes were paid for by tenants and 53% by building owners. There was a wide divergency on amount of light needed, with the largest group agreeing on 50 to 54 foot-candles.

When compared with early retail installations, a larger percentage of office men were pleased with their new lighting and almost unanimously they said they would recommend it to their friends. Obviously, this was due to their receiving a better engineered job, since almost nine out of ten sought competent advice before buying.

Not only in stores and offices, but also in homes, hospitals, schools, every type of building in which people congregate, the new salesman, modern lighting, offers contractors and equipment salesmen a challenging opportunity. As with every worthwhile opportunity, this one presents its problems, some of which have been outlined above. The challenge in this opportunity lies in the obligation to avoid some of the mistakes that were made in too many of the original fluorescent installations, some of the most serious of which are brought into clear focus by the surveys summarized above.

Only by selling modern lighting, instead of fixtures, only by merchandising a complete and adequate lighting installation, can electrical men fully capitalize on the brighter days ahead.

It is important that distributors understand what this new salesman can do for them. It is, perhaps, even more important that they understand what modern lighting can do for their customers. If they are to successfully merchandise modern lighting at its best, they must fully appreciate and definitely sell the benefits which planned lighting offers their commercial customers.

New Tools and Techniques

Consequently, a summary of what the new lighting tools and techniques offer the retailer is of both interest and value to every electrical wholesaler and his salesman. A clear and detailed picture of what modern lighting does for the merchant cannot help but have an exact bearing on the size and success of every lighting installation contract.

The modern merchandising interior has always been dependent on good planning. In the postwar years, it will be dependent more than ever before on good lighting. The power of suggestion, which has long been recognized as a potent force in selling, largely depends on dramatic, flowing lines of light that lead shoppers from one sales area to another. New applications of new light sources can bring striking lighting effects to store interiors, effects that can range from restrained suggestion to dramatic sales emphasis.

Light, therefore, has become an important merchandising aid, a sales *essential*. Its new applications demand primary consideration from those who plan to sell retailers better lighting for better selling.

What electrical men think about the part that lighting will play in postwar modernization is important; what their customers think is vital. Both will properly interpret modernization as more than a style race between stores. It will be a complete rehabilitation in some stores; a continuing activity in others where it maintains and improves the merchant's competitive position and constantly brings back old customers and attracts new ones.

Lighting modernization will include all the factors that contribute to better identification and promotion of store-premises, the forces that can help to increase a merchant's prestige in his community. Modern lighting, when properly sold and installed, will simplify and speed shopping for his customers, make merchandise easier to see and to appraise, and make it more attractive and desirable.

The contractor who sells and installs modern lighting most successfully must forget that he is selling lamps and fixtures. He will remember that he is making available to his customer the first essential of every modernization plan. Planned lighting will enhance the effect of redecorating, refurnishing, and replacement of equipment. And, as it performs these and other functions, it becomes not only a salesman for the electrical man, but also a salesman for the merchant. Outside, planned lighting serves with newspaper, radio, and direct mail advertising to increase the attention and prestige value of a store. Inside, it impells action, creates a desire for specific merchandise, sells by suggestion.

To be a good outside salesman, lighting should be attractive and aggressive, working day and night to compete with the brilliance, color, and movement of street and sign lighting, doing a good job to make a modernized store-front stand out among its neighbors in the block.

Store Fronts and Windows

The lighting consultant who is selling lighting rather than fixtures will first visualize the possibilities of the front and windows. If the store has an all glass front, he will picture the entire interior as a stage on which he must dramatically light the displays of the retailer's most timely merchandise. Even the conventional window can be made the most productive form of outside selling, when vitalized with the higher lighting intensities and tasteful use of color necessary to stop passersby.

Window lighting must do a three second selling job; do it the hardest way, by cold-canvass. Most customers for commercial lighting will know that pedestrians, at an average walking rate, will pass an average seven foot window in approximately three seconds. In this brief interval, if the window has not attracted and stopped potential customers, the store has missed an opportunity with four-fifths of the normal foot traffic.

Consequently, no ordinary job of window-lighting is good enough. The modern retailer pays a high salary for the services of this outside salesman. Many merchants charge between 25 and 50 per cent of the entire rental cost of first-floor space to their show windows. They know that there are

The lighting consultant who is selling lighting rather than fixtures will first visualize the possibilities of the front and window. If the store has an all-glass front, he will picture the entire interior as a stage on which he must dramatically light the displays of the retailer's most timely merchandise.

four principal reasons why people enter any store.

Satisfied customers, according to merchandising experts, account for the largest group, 41% of normal store traffic. Advertising attracts 11%. Another 20% is made up of permanent patrons. And, second only to satisfied customers is the great group of people who stop, look and shop, the 24% attracted by show windows. To convert "go-bys into come-buys" in three seconds requires both good window dressing and top-flight window lighting. Many factors affect window attraction, and these might will be studied by those who will merchandise the necessary equipment. A window should have one theme. Whether in mass display, or as a small number of integrated displays, the window ensemble should be dramatically arranged and dramatically highlighted. A high degree of brightness is essential, with plenty of foot-candles on either light colored merchandise or contrasting backgrounds. The window lighting installation should insure balanced brightness, with higher intensities on the central items to attract customers' eyes to the main display. Background colors should be simple, chosen to emphasize, not outshine, the display itself. Proper window lighting with dark items displayed against light, or light against dark backgrounds, will bring into sharp silhouette featured merchandise.

Obviously, since show windows are designed for frequent changes, lighting, too, should be flexible. New combinations of fluorescent and filament lamps have been designed into a single fixture. New flexibility is achieved by making inset filament fixtures directional throughout a range of thirty degrees so that the lighting may be changed as the display is rearranged.

Lighting Inside the Store

As an essential member of the inside sales force, modern lighting has many important functions to perform It contributes to quicker buying decisions, stimulates greater customer circulation, reduces errors and returns, enhances the beauty of merchandise, assures better housekeeping, provides harmonious atmosphere.

Those who sell lighting to retail stores as a means of modernization and a stimulant to better merchandising will find many locations in which modern tools and techniques can contribute to better seeing and better selling. A recent survey of the customers leaving an eastern department store revealed the fact that only 15% of the purchases made represented merchandise the shopper had come to buy. Of the sales tabulated, 85% were seen and purchased by sight.

The merchandise and store areas that get the biggest play are those that stand out, attract customer attention.

(Continued on page 108)

Opportunities Ahead in Lighting!

By W. A. Feuillan, Jr.*

Regional Vice-President

Illuminating Engineering Society

NO CRYSTAL ball is needed, no oracle required, to predict that the next five years in lighting will be unprecedented: in development, in application, in prosperity!

Four years of war, the almost total absence of commercial and residential equipment, the conditioning of workers to better light (by 35, 50 and more foot-candles), the tremendous strides made in fluorescents, have all contributed to a pent-up demand, whose size no one really knows, that should sweep the industry to new heights.

Much of the old has gone. The passing years and wartime demand have cleaned shelves, bins, warehouses. We are at the threshold of a new era. We can begin anew. The future is bright with promise. What a wonderful opportunity is offered by the next half-decade!

Yes, lighting should make its greatest progress in the next five years, unhampered by the physical limitations which restricted it, held it in check, in the past. All prior lighting sources were an effect of fire (incandescence) with heat as a necessary corollary and with only a fraction of its energy usable.

The new source, fluorescent, opens vistas of cool, comfortable light in new forms adaptable to shape and size of areas to be lighted, providing higher intensities of eye-acceptable, fully-diffused light for general illumination. We can soon expect fixtures designed for function and setting their own style. The chandelier, the candle holder of the past, will be replaced with built-in or built-on fixtures . . . or with fixtures which seem built-in or built-on, part of the decoration of the room itself.

Many in the electrical industry who specialize in lighting, and lighting of the future will require even more specialization, know that the specification of lighting is slowly but surely approaching professional status. Recommendations are founded on provable engineering formulas. The quantity and quality of light for the given task can be specified by the lighting specialist or lighting engineer, and his counsel is scientific. He should be in the category with the doctor, the lawyer, the architect, etc.

His premise must be, "The best lighting for the job, based on Lighting Performance Recommendations (establishing standards for quantity and quality) and Recommended Practice (outlining recognized usage)." The equipment application may vary but eye-comfort, freedom from glare, and ease-in-seeing cannot. These are ethical principles and will come first with those of professional integrity.

Public Needs Expert Advice

Store owners, factory and shop operators, office managers, home-makers —all want advice, suggestions, ideas. They soak them up like sponges. But we need to know, we can't guess when we give advice. It must be advice as Webster defines it, "Recommendation—based on knowledge or experience, often professional or technical."

Insufficient, improper lighting does no good to the eyes of children, or to those of grown-ups, either. Abuse can only harm eyes. We are told that one out of five school children need glasses and three out of five adults should wear them continually or for reading, sewing, etc. Good lighting won't correct or cure refractive errors, but it does improve visual acuity and can prevent needless eye impairment.

Workers in industrial and many other plants enjoyed the stimulus, benefits, convenience of engineered illumination for 8, 10, or 12 hours a day, and then went home to poor, or at least inferior, lighting. As homemakers, they have been light-starved. They definitely need more light in their homes for comfort, cheerfulness, and good-seeing.

When lighting fixtures are again available, they will be ready and eager to buy, providing, of course, the industry convinces them, through advertising, of the need for adequate light in homes.

It is heartening to see the Illuminating Engineering Society formulating, revising, completing, and issuing their "Recommended Practices" and "Lighting Performance Recommendations." Here is basic, practical information. It enables the industry to use a uniform language; to understand, and to be understood. This should do much to end the babel which has so confused the buyer and user of lighting, and parenthetically, the seller also.

We know that lighting for war was magnificently done, that lighting played its full part in increasing production, in making practical 24-hour a day operation of industry, in decreasing eye-strain, fatigue and absenteeism. Lighting deserves the citations it has received, but lighting has a bigger job in the peace. It can do much to make living richer, fuller, and more complete for all our people.

We are at the cross roads. It's not merely reconversion for the lighting industry; it is a rebirth. We can make a new beginning. The old, the archaic, the lighting which belonged to the "dark ages," is out. The war has given us the opportunity of another try. We must avoid the mistakes of the past, apply the lessons learned during the war production period, and face the future with determination and confidence. We must make a fresh start.

Out of the war has come further evidence that diffuse, glareless lighting is most satisfactorily tolerated by the human eye. Can't we, shouldn't we, design all general lighting with that as our prime consideration? And supplement it with adequate localized

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lighting for sustained visual tasks, of course.

War restrictions, limitations, estoppels may yet prove blessings in disguise. We now know what is essential and what isn't. We have learned the importance of light for seeing, and there's no need to go backward. We must build on what we have and go ahead to better lighting, better business.

Polls, surveys, prognosticators, all tell us that the volume of postwar sales of lighting equipment to industry will be small. This may be correct for the national picture. In the South, it will probably be different. We have had a tremendous war-impelled development of industry below the so called Mason-Dixon line. This won't be abandoned. Rather it should expand. We have the plants, raw materials, manpower, and with our war-learned know-how, we'll do business.

Look, too, for "boom" proportion demand for relighting offices, stores, and shops. Modernization of business establishments is merely waiting for availability of materials, fixtures, etc. The same experts predict business in constantly increasing volume for the next five years for manufacturers, wholesalers and retailers, all of whom will need dynamic, dramatic, engineered lighting for the selling jobs of tomorrow.

While design and application information is "hush-hush" at present, enough has filtered through for us to know that many new concepts are in the offing. Fixtures for stores, offices, and shops will utilize baffles, louvers, glass, plastic in many ways. Light, we know, will be shaded or shielded. In more elaborate installations we will have light from concealed or non-apparent sources. Intensity, now that we accept 35-50 foot-candles, will be less important than diffused, easy-on-the-eyes quality. And we will, almost certainly, get away from the inverted forests of fixtures. As I said before, we should see more built-in, built-on, or seemingly built-in and built-on fixtures, designed to blend in or harmonize with interiors in which used.

The greatest volume of equipment sales postwar will be in the residential market, it is predicted. Nearly one-third of an estimated ½-billion dollars will be spent annually in the U. S. for home lighting — fixtures, lamps, etc.—for at least five years after the war. This in addition to 1/8-billion for commercial lighting and over 1/6-billion for "bulbs," as the public calls them. If the South gets its pro-rata of the national average, this means a residential potential three times pre-war and a commercial of ten times. Plenty of business for all who sell lighting!

Postwar homes will be fluorescent lighted say the experts. But not right away, some add. Don't bank on that. Surveys show that the public wants fluorescent lighting in homes. And what the public wants, it gets, within reason, of course. The industry's big job is to direct this demand into the right channels, for well-designed, well-made fixtures.

Such fixtures for the brave new world are not yet available, but they will come. And they'll come sooner, if we in the industry hold to high, professional standards. Lighting has been too much controlled by the past. We have talked better lighting for homes but done next to nothing about it. Even the nomenclature of the industry dates back to candle and candle-holder days. Now, with new lighting sources, and with the chance of beginning again, we can throw off the shackles and start afresh. We have been timid, skeptical of change, and we had old merchandise to sell. That's over with, finished. We can start from scratch as it were. But we need reconversion in thinking almost as much as we need new merchandise.

The war brought residential lighting to its lowest ebb. (This may develop a revulsion to cheap lighting that will be a real help in getting customers to demand better lighting.) Lighting for war housing dropped down to $5 a unit, $1 a room, and for units valued at $5000 and more, to 1/10 of 1 per cent for lighting!

Prior to the war, fixture appropriations of popularly-priced homes were fixed at 1 per cent. This was inadequate, we knew, but the industry seemed helpless to correct the condition. We can and should seek bigger appropriations for fixtures if we hope to sell better lighting postwar. Look at the makers of electrical kitchen equipment. They ask for 10 per cent and get or come pretty near getting it . . . and this for one room. The makers of plumbing (swanky bath and powder rooms) and ventilation (attic fans) ask for, and get, substantial percentages, too. That's the sort of thing we must do. Manufacturers must give us better fixtures for better lighting, and we must show customers that a minimum expenditure won't produce maximum results.

"Lighting should be one of the businesses first to revive and react to the postwar plans and needs of commerce. It offers quick, easy, and inexpensive modernization for stores, shops, and offices. Already, and all around us, there is evidence that owners won't wait. They are 'jumping the gun' as WPB releases materials. So the alert wholesaler, dealer, and contractor will prepare now to share in the greatest lighting market ever."

It may be pertinent to mention here that manufacturers who advertise in national magazines should point out to editors the fallacy of running articles which suggest making fixtures out of pie plates, discarded coffee tins, quaint powder dishes, old jars, etc., in the same issue in which their paid-for advertisements appear. Let's put an end to foolishness like that in a current home magazine, which suggests, in all seriousness, that cheese graters be used as shades on a Colonial living room fixture. Nonsense!

And while the homemaker is being sold better lighting, better fixtures, we must sell her on adequate lighting in living and dining rooms. About half the fixture appropriation is usually spent for living room and dining room fixtures. If the living room fixture is eliminated we cut the appropriation one fourth. Wishing and saying "you ought to have overhead light" won't bring it back.

Let's face facts. The complaints about the central, overhead fixture in the living room, "light shines in our eyes" and "I can't find anything I like except at a high price" are responsible for the disappearance of this needed, practical aid to good illumination. To bring it back we need fixtures which will overcome customers' objections. And we need educational work in magazines, via radio, by mail, etc., by trade associations and others. But most of all, we need an overall plan to sell adequate, well-designed, and well-made lighting fixtures for postwar homes.

The day of self-medication is over. The day of buying lighting without plan or direction should be. Lighting has a wonderful second chance. We must do more than simply go back to minimum price, pre-war and war-time selling of packaged lines of lighting fixtures. Such selling can produce only minimal installations. It can provide only enough light to see by. What we must offer now is lighting with which to see well. We must shield or shade light for best vision, compatible with comfort. We must offer engineered illumination.

(Continued on page 48)

How To Light Food Stores

By W. E. Folsom
Illuminating Engineer
Dallas Power & Light Company

IN THE "bright new world" of tomorrow, food stores are going to be vastly different places from the drab and dingy groceries of yesterday. For several years before the war, the pattern of the future was taking shape in the modern "super market". Great advances have been made toward the streamlining of food retailing, but present indications point to the fact that still greater changes and improvements in food store planning and operation are in store. These improvements have to do with the display and sale of a large variety of fresh, canned, bottled, packaged and frozen foods.

The extremely high volume of business enjoyed by food merchants in recent years, together with the fact that war-time restrictions have prevented any major physical changes or improvements, makes certain that much is to be done as soon as materials and equipment are again plentiful. The highly competitive nature of the grocery business, with its rather low margin of profit, requires volume trade. It is this necessity for volume trade which brings lighting prominently into the design and operation of food stores and markets.

The first problem of the food merchant is to attract customers to his store or to tie in with newspaper advertising by making store identification easy. Having attracted the customer, a place must be provided for him to park his car. As the customer enters the store he is made conscious of the up-to-dateness and cleanliness of the store and he must be made to feel welcome by a cheerful atmosphere. The store as well as the employees should wear a smile. Of course, the extensive array of foods should be appealingly and conveniently displayed. A few specials may even be "accented" to give them extra appeal. Arrangement of goods and display very subtly help direct traffic to all parts of the store.

No merchant can do his business entirely by daylight or sunshine. Artificial lighting can play an important part in every phase of the process of selling groceries.

Exterior Illumination

"Open faced" stores are the order of the day! Many a postwar plan calls for store buildings that may be easily seen into from outside. This is an important consideration in determining the basic design of the store, and this plan creates many new problems and opportunities.

In the first place, an area of light around the store is important as a means of attracting attention and creating the impression that here is a live, wide awake institution.

Such an atmosphere is natural for a food store since the modern grocery is a development of the town market of the past. The path of development has been devious, as not so many years ago the average grocery was a comparatively dark, dingy place.

An effect of brightness on the store's exterior may be secured in a variety of ways; the simplest is probably the general floodlighting of the building. For successful floodlighting, it is essential that the walls and surroundings of the building be light in color as only such surfaces will reflect light effectively. It is often more striking, however, to construct a large luminous area as a feature of the building's exterior. This may be a translighted or colorfully floodlighted tower. It may mean luminous pylons or decorations at the building's entrance, or it may mean a large area luminous sign as a feature of the upper section of the building.

The store of the future is commonly visualized by the laymen as a bright and glowing structure. There are many advantages in achieving some measure of this goal in the up-to-date food store.

A brightly lighted exterior is an important means of advertising and vividly establishes location in the minds of the customers.

There is another aspect to the exterior lighting of stores. What will the night-time appearance of the store

be after closing hours? It is important that any lighted architectural feature which makes the building a landmark be fully utilized to impress the passers-by. Lighted signs, especially of the architectural type, can be valuable in impressing the store name into the consciousness of the community. The lighted show window, too, can be arranged to line up "tomorrow's business."

Show Window Lighting

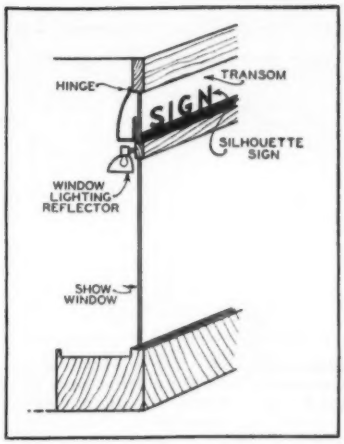
The show window is a very vital part of the store front and should be considered as such. Since food stores by nature are quite often of the open-front type, or consist of large areas of glass, allowing full view into the store, high mounted displays or totally enclosed windows are impractical.

It is observed, however, that because of this slight difficulty, many operators have allowed this valuable show window area to become almost a loss. Quite often, this space, which is most readily seen by both motorist and pedestrian, is found to be the least attractive spot in the store. By all rules of good merchandising, this does not "add up." Nor does it fulfill the requirements of good design for maximum attracting power.

The well-arranged exterior, which provides adequate levels of illumination for customer parking and the general surroundings, equipped with well-placed signs of extremely high brightness, are at a definite disadvantage if it leads the eye to a set of low intensity unattractive show windows. The complete picture calls for colorful, sparkling displays, low mounted to allow through-store view, and these should be lighted to a very high foot-candle intensity. Fruit and vegetable departments work logically into this location and can be made into attractive display arrangements.

For the lighting of fruit and vegetable areas, very fine results have been obtained, particularly from the standpoint of color, through a combination of fluorescent and incandescent mounted directly over the areas in shielded, direct-type concentrating reflector equipment. Interesting effects are created by the use of additional incandescent reflector spot lamps in highlighting particular features of the display.

Because of competing brightness from exterior signs and rather high levels of illumination from interior store lighting, show window intensities should be in the order of one hundred food-candles or more.



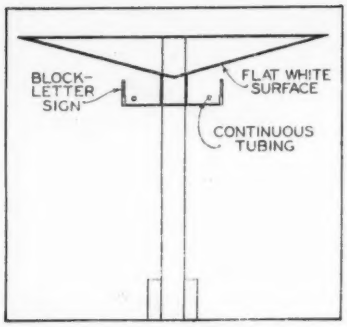
Good example of show window lighting utilizing lighted transom and silhouette sign.

Parking Area Lighting

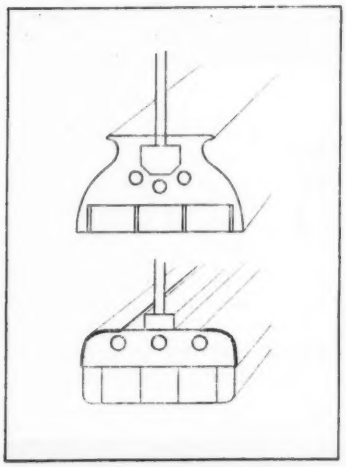
Automobile traffic and customers' parking difficulties have become a major problem in many popular shopping districts. As an added attraction to motorists, many large store operators have found it economically sound to provide private parking areas adjoining the building. Properly installed floodlighting at these customers' parking areas is highly desirable. This type of lighting allows adequate illumination for protection and at the same time provides large areas of brightness near the building, which supplements the general extensive lighting of the building.

In the lighting of these parking spaces, it is well to maintain as high a level of illumination as is economically possible. The minimum should not be less than one and one-half to two foot-candles. Additional efficiency may be obtained through greater light reflection if light-colored concrete rather than dark paving is provided. This is an important point.

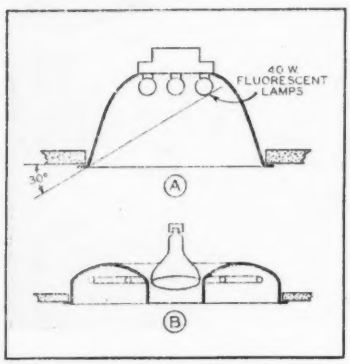
Floodlighting equipment may be one of several types of standard units. Generally, medium or wide spread, open-type floodlights, mounted about thirty feet above ground, are suitable and practical. In some cases, flood-



Luminous cover for parking area walk-ways. Block lettering may be used in silhouette along light trough.



Types of pendent fluorescent fixtures with louvers to control the down light and top openings to provide upward light to illuminate ceiling.



(a) Type of recessed reflector for three 40-watt fluorescent lamps. With 10 x 10 to 12 x 12 spacing and 12-foot, or more, ceiling height, the resulting illumination will be 30 to 40 foot candles. (b) Suggested type of direct lighting unit using new circular fluorescent lamps for general lighting. Lamps 12" and 16" in diameter are shown with a 300-watt reflector spot lamp for accent lighting centered in the fixture.

lights may be mounted on the building parapet or wall while others might require pole mounting. Careful attention should be given to the location, mounting height, and shielding of floodlighting units so that principal traffic approaches to the store and parking areas do not receive direct glare from the units. Where possible, direct floodlights toward the building rather than toward traffic.

In planning the new "Super Markets," some designers are treating the parking areas in a more architectural manner with well lighted covered walkways giving weather protection from car to shopping area. Such ingenious parking arrangements are often integral to the design of the store. These canopies are ideally suited to the use of continuous fluorescent tubing (necessarily cold cathode type in many locations) for path walk lighting and silhouette letter signs for advertising and directional functions.

Interior Lighting

It is difficult to think of any part of the home, business or work world where seeing is not important. Vision is certainly an essential of almost every human activity. How well a person sees depends on the condition of the eyes, the characteristics of the object seen, the light on that object, and the nature of the surroundings (for the human visual mechanism covers a wide field). The eyesight specialist is concerned with the eyes, the illuminating engineer with the light, the object seen, and the surroundings as they affect vision.

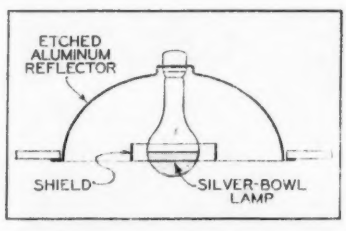
We are concerned here with lighting and visual surroundings for food stores, and how light may contribute to the successful operation of such stores.

The interior lighting is a tremendously important feature of store design. It must be remembered the food merchant is selling food and food products, not lighting fixtures. It is basic, therefore, that the lighting equipment be inconspicuous but that the lighting be carefully devised to dramatize the goods on sale.

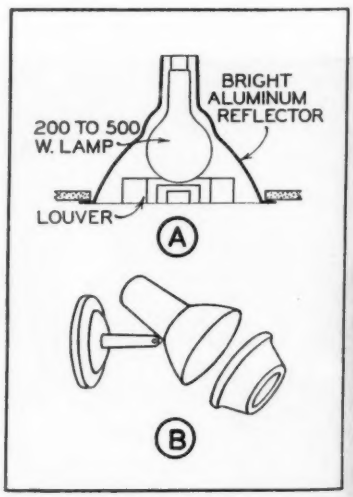
When a store is air-conditioned, the customer is not conscious of the air-conditioning equipment or of the location of the vents. He is conscious rather of bodily comfort and the pleasing qualities of his surroundings. So it is in a "light-conditioned" store. The customer is not conscious of lighting equipment or fixtures. He enjoys the pleasing glows of a luminous atmosphere and at the same time his attention is attracted pleasantly to the goods on display. Bright or gaudy fixtures will detract attention from the goods and defeat the purpose of his visit to the store. Proper lighting on the other hand will help create a desire for the merchandise displayed.

Carefully arranged high intensity lighting makes it possible for the merchant to sell more goods in less space. This decreases selling costs and increases total profits. By a careful arrangement is meant the location of lights in a way that they will shine on the goods from the same direction in which the customer is looking, and not "glare" in the customer's eyes. High intensity of proper color from the right direction will help to give foodstuffs their natural appearance which is essential for their sale.

Furthermore, sales are made by directing light to the merchandise—not on aisle-ways, ceilings, or walls. There should, however, be enough general lighting (by reflection or otherwise) to give the room a cheerful luminous appearance.



Type of recessed aluminum reflector with silver bowl lamp for diffused general lighting.



(a) Type of louvered direct lighting reflector for high-lighting displays. (b) Reflector spot lamp in adjustable holder for accent lighting.

For maximum utilization of light and maximum attention to merchandise, ceilings are painted a flat white, walls a light flat pastel tone—as pale green or light cream, and cases and furniture finished in light neutral colors.

Three types of light sources are available for general illumination. They are the incandescent lamp, the fluorescent lamp, and cold cathode tubing. Each has its advantages and appropriate use. Two or more types of sources may be used to advantage in combination; as for instance, a fluorescent fixture with built-in incandescent reflector lamps.

Incandescent lamps are concentrated sources of light and lend themselves to easy methods of control. They are a practical necessity for the accenting of displays. Fluorescent lamps have an advantage of higher efficiency and lower surface brightness. The cold cathode tube is useful for its flexibility of shape and the ease with which it is adapted to special design. The resultant illumination from fluorescent "F" lamps and cold cathode fluorescent lamps is similar.

Today, it appears that the most desirable market lighting system would be one which would direct a large part of its light to the merchandise, and yet at the same time would illuminate ceilings and walls to some extent. In many recent installations, fluorescent reflectors and lamps have been recessed in the ceiling which is itself lighted by light reflected by the merchandise, the furniture, and the floor. Another method is to use a pendent fixture which will direct a large portion of the light downward, yet permit 10% or more to escape from the top of the fixture to the ceiling. It is important that such fixtures contain some louvering device to conceal the lamps from angles below 45 degrees.

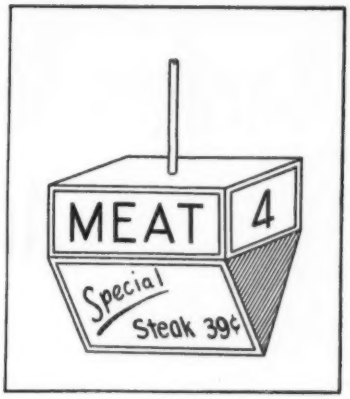
Much that has been said so far applies primarily to the large food store or super market. A small store, 20 feet or less in width, may be lighted suitably in a totally indirect manner. Intensity should be high (30 foot-candles plus) so that the effect is cheerful and efficient. As the walls and floors will be well filled with merchandise, the bright ceiling will not detract the eye as it would in a store of a larger area.

Fruits and Vegetables

Natural color magazine advertisements of fruits, vegetables and other foods are usually real "stoppers". A person is unusual indeed that has not had the mouth-watering experience of gazing longingly at a colored photograph of, say, some choice apples. Foodstuffs, generally, are colorful and attractive, yet how unusual it is to see a really attractive display of these foods. Such full color advertisements may contain a suggestion for the grocer!

Great care should be taken in

(*Continued on page 106*)



Departmental identification sign using flashed opal glass panels. "Specials" may also be indicated daily by lettering on removable panels. Unit contains three 60-watt filament or three 20-watt fluorescent lamps with 24-inch sign.

Garages Need Better Lighting--- And Contractors Can Sell It

THE INGALLS Electric Company of Miami, Fla., recently made a "better lighting" installation in a business field which definitely needs—but often lacks—adequate illumination of working facilities. And, in this instance, not only did the customer get a 500 per cent improvement in his lighting, but he effected, also, a sizable saving in current-consumption costs.

The story properly begins with a telephone call from R. D. Freeman, vice-president and general manager of the Miami Transit Company. Calling W. W. ("Bob") Ingalls, of Ingalls Electric, Freeman told him: "We have to do something about our shop lighting. Our maintenance superintendent says he has reached the ceiling on available repair personnel. But, with better illumination, he believes he can turn out more work. And *that* we must have. Will you check up on our lighting, and tell us what you can do?"

Miami Transit operates a fleet of approximately 275 busses. These comprise the city's only large-scale, public transportation system. And, not only does the latter have to serve expanded civilian needs, but it must, also, transport thousands of service men, assigned to duty in the Miami area or on furlough there.

Therefore, although the greater part of the company's busses have been in use for 5 to 12 years, they must be kept going every day and all day—some of them around the clock. To render this kind of transportation service, obviously, they must have regular mechanical maintenance.

For handling this portion of its job, the transit company has two large repair shops. Together, these are staffed by a working force of 135 mechanics and helpers, and are operated on a 24-hour-per-day basis.

Acting on Freeman's request, Ingalls sought the cooperation of the local utility (Florida Power and Light Company) which assigned A. C. Bergh, lighting engineer, to assist in making a survey and in working out corrective measures.

Ingalls and Bergh began their check-up at the bus company's Northside shop, located at Northwest 54th Street and 22nd Avenue. This is a 90 ft. by 250 ft., concrete-and-steel building of fairly recent construction. Nevertheless, lighting provisions were found to be woefully insufficient to meet normal, let alone "emergency," requirements.

Although many mechanical reconditioning operations and adjustments must be kept within tolerances (allowable variations from manufacturers' specifications) of no more than .001 inch to .005 inch, general illumination was supplied by clear glass, 500 watt lamps. These were hung haphazardly and lacked reflectors. Consequentliy, illumination was "spotty"—good in limited areas but, for the most part, poor.

Drop lamps provided the only means of artificial lighting for close work—engine adjustments, carburetor, and electrical settings, for example.

To remedy the shop's general lighting inadequacy, Ingalls installed 180 lighting fixtures, each of which is equipped with two 40-watt, fluorescent lamps. These were located 8 ft. apart on centers, and were hung 8 ft., 9 in. above the floor. As the net result of this installation, all-over shop illumination was raised to 25 foot-candles.

Not only does this amount of lighting take care of areas where the demand is greatest—such as at a 190-ft. work bench which extends along the larger part of one side wall—but many former "dark corners" are now illuminated, as well. There was, however, one exception to the "adequate lighting" provided by the fluorescent installation.

Vitally-necessary chassis lubrication is done in bus-length pits, over which the vehicles are driven. At the Northside shop there are 9 of these pits. To replace ordinary drop lights, Ingalls installed at each end of each pit a well-mounted, 200-watt, vapor-and-dust-proof lamp. As direct benefits accruing from this change-over, mark down more painstaking lubrication, greater work volume and—since heav-

Lighting for lubrication pits is an interesting problem encountered in lighting garages. In this instance, vapor-proof 200-watt lamps were installed on end walls. Vapor-proof plug-in receptacles improve the safety factor. At right, a mechanic is endeavoring to adjust tool having a tolerance of one thousandth of an inch. This picture was made before new lighting was installed and the poor lighting is noticeable.

ier-than-air, combustion vapors collect in floor depressions—the introduction of a safety factor.

Another advantage gained by the lighting changes made is the elimination—except in rare instances—of all need for drop lamps. Not only is the employment of drop lights a sizable time-waster, but there is, also, the no-inconsiderable expense-item of lamp and cord replacements. In automotive shops, especially, the mortality rate on this type of equipment is high.

The Ingalls-Bergh plan for stepping up work output in the bus company's Northside shop, went beyond the betterment of interior lighting. On the program, too, were an exterior illumination setup and a revamping of the shop's facilities for supplying power current.

Adjoining the shop structure, at this location, is a 5-acre, wire-enclosed tract of land. Part of this is employed for parking vehicles, when not in use. And part is used for carrying on various maintenance operations, such as bus-washing and cleaning (interiors) and tire-changing. Understandably, the greater portion of this work is done at night. At best, lighting, here, was inadequate. And, in some areas, it was entirely absent.

To correct this situation, Ingalls installed fifteen 750-watt, playground-type floodlights. Three of these lamps were used to illuminate a 200-foot, concrete strip, where the tire-changing operation was carried on. Part of the lights for general yard-illumination were attached to the building, itself. The remainder were pole mounted.

Much of the shop equipment employed is electrically powered. And it includes many portable items, such as precision testing apparatus, arc welders, and power drills. Plug-in outlets for equipment of this kind were insufficient in number, and, from a convenience standpoint, those already installed were poorly located.

As a means for step—and time—saving, a 4-outlet receptacle was spotted every 10 feet along the wall, behind the work bench. Thus, each mechanic, now, has ample facilities for plugging in an electrical power tool or testing device. He no longer has to waste valuable minutes hunting for an available outlet. Trailing lead cords, too, can be shortened. And this, in turn, results in cord economy.

In connection with its maintenance work, the shop does a considerable amount of arc welding. To plug in the equipment for this operation, there was only one receptacle of proper type to carry the load—in this case, 50 amperes. As still another time-saver, Ingalls installed, at 40-foot distances, a total of six 50-ampere receptacles, and, attached to the lead cord of the apparatus, a 3-pole, plug-in to fit the receptacles.

Often, it is necessary to use power tools in connection with work done at the lubrication pits. Therefore, the latter were provided with plug-in outlets, but of the unprotected type. As a "safety" measure, these were replaced by vapor-proof receptacles.

In conjunction with the changes outlined, the feed system and its controls were overhauled, too. "Juice" for interior illumination is distributed by four 12-circuit panels. Exterior lighting is controlled by a separate 166-circuit panel. There is, also, a 10-circuit panel to feed the power receptacles.

B. C. Bragg, construction superintendent for Ingalls Electric Company, Miami, checks up on the main switches.

The maintenance of specified voltage to all fixtures on any given circuit, according to Ingalls, is good life insurance for fluorescent lamps. And one important element in maintaining voltage to the end of the "run" is to provide a conductor of adequate size.

Therefore, for this fluorescent installation, no wire smaller than No. 12 was used. All conductor smaller than No. 12 was removed, and new wire was pulled in. Much of the conduit already installed was usable but several thousand feet, ranging in size from ½-inch to 2½-inches were required for replacements and for additional circuits.

After viewing the results of the completed job at the Northside shop, the bus company ordered a similar lighting overhaul at its main location (Northwest 8th Street at 7th Avenue). The building, here, is 100 ft. by 300 ft., and in it are conducted heavier mechanical operations, such as chassis rebuilding.

The equipment used—most of it electrically powered—is calibrated in .001 inch. Obviously, ample light is needed to insure accurate work. And other operations—the reconditioning of electrically-controlled fare boxes, for example—requiring a high illumination factor, also, are carried on in this shop.

The building's roof was constructed

(Continued on page 104)

Special tests require good lighting and closely spaced receptacles.

Anderson Plans Electrical Department Store

WARTIME merchandising of lighting fixtures has been a testing ground for ideas that will be incorporated in a postwar electric department store at the Anderson Electric & Supply Company, Fifth and College Streets, Charlotte, N. C.

Backbone of the new electric department store will be their present advertising system which has been in use for several years.

Advertising used by Anderson in the newspapers is unique in that every illustration is a line drawing of a photograph of the actual fixture in stock.

The customer can (and does) bring in an advertisement torn from a newspaper and picks out the merchandise on display from the advertisement.

Photography, art work and engraver's charges make each illustration cost them $14 which is in addition to the cost of the advertising space.

The average merchant will immediately conclude that it's a lot of money just to get a little truth in his advertising. Use of a stock illustration is common and ethical as far as selling goes but that's not enough for Anderson's.

"That one feature alone has built up a mail order business extending for almost 200 miles around our store," W. T. Anderson said. "These people have learned the illustrations are actual reproductions and they buy with confidence that the article will look as represented."

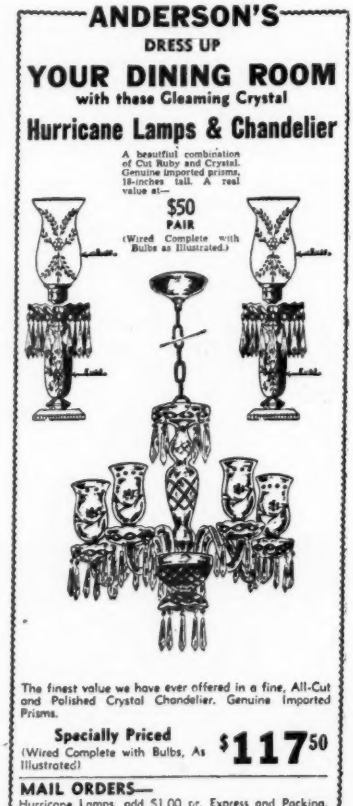
Another merchant might say that a stock illustration would do just as well because the chances are the customer will not buy that identical article but may select another from the stock that he likes better.

Mr. Anderson is qualified from experience to answer.

"That's just the point. When the customer sees that the identical article is the same as illustrated he has sufficient confidence to buy a high priced article if it suits him better. He has been convinced that the firm practices complete truth in advertising. This customer is more easily sold higher priced goods if they are within his means. We keep the confidence of the customer."

There is another trouble that makes dissatisfied customers, through no fault of the store, that will be corrected in the postwar store of Anderson Electric & Supply Company.

This trouble comes from having low-priced and high-priced fixtures in the same display. The customer comes in, perhaps in response to an advertisement for a low-priced crystal fixture. This item is just exactly as represented. It was illustrated from a photograph of the actual fixture. But while examining the item, the customer sees some other crystal fixtures that he likes better and inquires the price only to find that they are several hundred dollars or much above his buying range. He is dissatisfied with the first item and he can't afford the higher priced one, and nine times out of ten, he will go out without buying any and with some feeling of resentment.


ANDERSON'S
DRESS UP
YOUR DINING ROOM
with these Gleaming Crystal
Hurricane Lamps & Chandelier
A beautiful combination of Cut Ruby and Crystal. Genuine imported prisms. 18-inches tall. A real value at—
$50
PAIR
(Wired Complete with Bulbs as Illustrated.)
The finest value we have ever offered in a fine, All-Cut and Polished Crystal Chandelier. Genuine Imported Prisms.
Specially Priced
(Wired Complete with Bulbs, As Illustrated)
$117.50
MAIL ORDERS—
Hurricane Lamps, add $1.00 pr. Express and Packing.
Chandelier add $2.00 Express and Packing.
N. C. Purchasers, Add 3% Sales Tax.
ALSO—
Scores of other Hurricane Lamps and Crystal Chandeliers to select from....
"For Lighting Fixture Values—"
ANDERSON
ELECTRIC & SUPPLY CO.
CORNER FIFTH AND COLLEGE STREETS

An unusual feature of advertising of Anderson Electric and Supply Co., of Charlotte, N. C., are the line drawings of actual fixtures available from stock.

The answer to this problem in the new store, according to Mr. Anderson, will be to have fixtures displayed in departments by their price range. The customer will be steered to the department in which he first shows an interest and all the other fixtures he looks at in that department will be in that price range—either a little up or a little down. Unless he shows evidence of being able to afford the higher priced merchandise and has a place to put it, he will not be allowed to see it. A man with a little three- or four-room house or apartment will not want a $250 crystal fixture and the man with a $17,000 home will not be interested in looking at fixtures selling for $17.95.

The department store idea will be carried out further after the war. A separate department will have clocks displayed, another mirrors, because war-time selling has proven that mirrors are an excellent sideline for a lighting fixture store.

Another department will show fluorescent and industrial fixtures which will include trouble lights for which they have already built up a large sale through consistent advertising of this common garage and household aid.

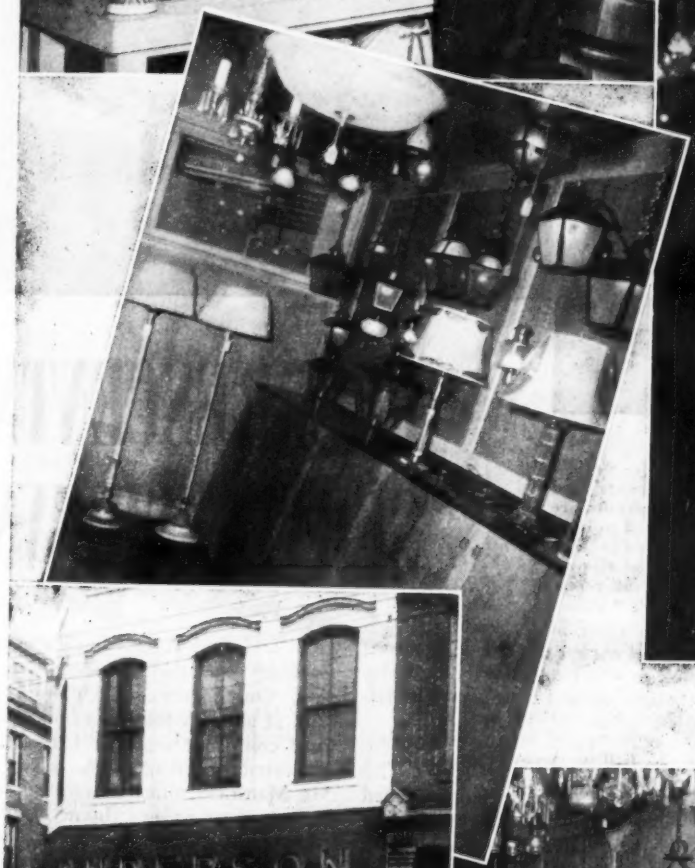
The electric clock department will stock everything and all styles up to and including a grandfather clock model. Here again will be an innovation. They will provide an electric clock repair service. The average jeweler, when an electric clock that he sold comes back to him for repairs, glibly tells the customer he is a watchmaker not an electrician. Repair service on electric clocks may not pay the light bills in profit but it will instill confidence in the customer. Lack of this service has prevented many sales of electric clocks.

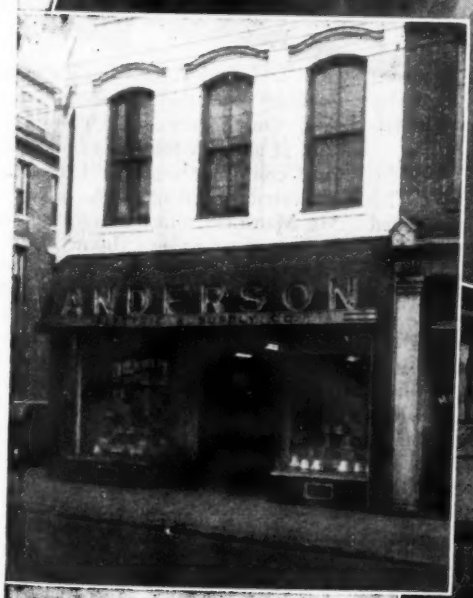
Anderson's have over 500 different items on display and find that most purchases are made by women.

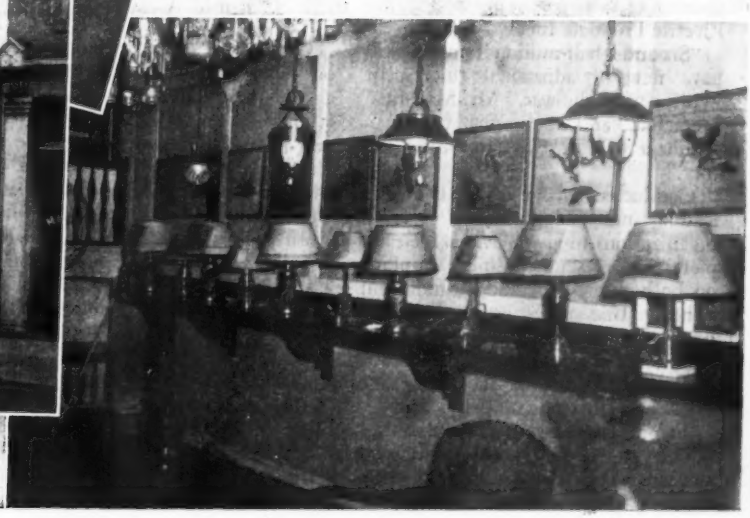
Volume is dependent on a large variety and a large stock, Mr. Anderson said, and people come where they have an opportunity to choose from a large selection.

Yard and porch lights have been in

(*Continued on page 48*)







Although the fixture displays of the Anderson Electric and Supply Company are grouped now according to usage, the company plans more departments as postwar fixtures become available. At left is a general view of the display showing ornamental lamps and crystal chandeliers. Left center, a display of outdoor, porch and ornamental lamps. Below, lamps of another day, modernized with electric wiring, occupy a prominent display. Bottom, lamps and wall pictures suitable for use in dens and playrooms.

Fluorescents and incandescents are combined to light this studio bedroom and all-purpose living room.

FLUORESCENTS SURVEY SHOWS

BY THE TIME fluorescent lighting is twelve years old, in 1950, the industry will be selling at the annual rate of approximately 10,000,000 fluorescent lamps and about 3,500,000 fluorescent fixtures for residential use alone, with every fourth wired home in the country a customer, according to indications from a nationwide home lighting study released recently by Frank Mansfield, director of sales research, for Sylvania Electric Products Inc.

"Six-and-a-half-million families will have new or additional fluorescent lighting after the war," Mr. Mansfield predicted, "and we can give it to them within a year or two after total victory."

Conducted by one of the country's leading independent market research organizations to give Sylvania a clearer picture of present consumer thinking on both fluorescent and incandescent lighting, this survey is the first in a continuing series on home lighting. Additional studies on radio, television and special electronic devices are also under way for the company.

Families in large and small cities, country towns and farms, from coast to coast, were queried in the residential lighting survey and the findings not only give the company a clue to future buying but reveal many interesting facts about current consumer purchasing habits.

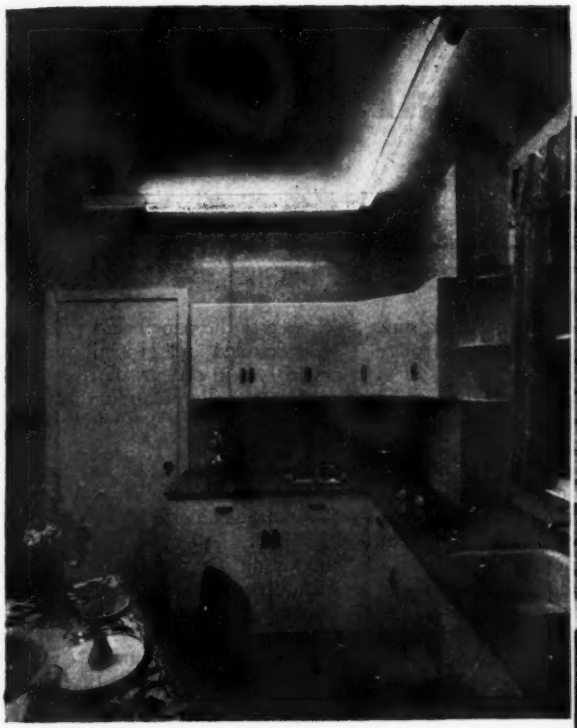
Utility Areas First

One out of every ten homes called on boasts some fluorescent lighting and of these families, half plan installations elsewhere in the house. Old and new customers alike put the kitchen first on the list to receive this modern type lighting, and want it in the bathroom and bedroom next. Both groups hope eventually to have it in all rooms, the majority planning on permanent fixtures. A smaller group say they will choose portable fixtures, while close to 20 per cent intend to have both types.

Asked what they thought about fluorescent lighting, ninety-four per cent of those who have it in their homes expressed satisfaction. The majority said they installed fluorescent because they like the quality of light it gives and find it easy on the eyes. Economy was the second consideration. Only six per cent could find any fault at all with fluorescent and their chief complaint was that fixtures are not attractive enough. According to Mr. Mansfield, this disadvantages will be overcome in new home lighting equipment. "These new fixtures will not be adaptations of commercial fixtures as at present," he said, "but are being designed especially for the home, with home decoration and comfort in mind."

It was found that fluorescent sales are in direct relation to living standards, with the top income group accounting for over 26 per cent of the installations and sales decreasing as income decreases.

Home ownership also appears to influence the market, for over 13 per cent of home owners have fluorescent lighting as compared with five per cent of those who rent. This same trend is indicated in the number of



IN THE HOME—ACCEPTANCE

Fluorescents are already well accepted by the public for lighting kitchen and bath. (Sylvania photos.)

rooms in the house, rent paid, value of the home and acreage of the farm.

To introduce modern, fluorescent lighting styled especially for the home, the Sylvania Electric Products Inc., recently opened its new Lighting Center in New York City. A result of months of research by company engineers, stylists, and architects, working with Lurelle Guild, noted design consultant, the group of rooms—living room, bedroom, study, kitchen and bathroom—reveal lighting that is as decorative as it is efficient.

The Lighting Center, according to William F. Rooney, head of the Product Styling Group, provides the company with a laboratory for experimenting with new residential lighting ideas and evaluating them over a sufficient period of time in their normal surroundings.

"Our goal in decorating and lighting the rooms," said Mr. Rooney, "was to avoid flat panels, boxlike fixtures and overemphasis on efficiency. Instead, we have made function, style and value our watchwords. The rooms are functional because they provide good lighting and enough of it, with a high degree of eye comfort. Also, such human factors as the way people sit and the use to which they put each room were taken into consideration. Then, the proper source of illumination was installed for each purpose.

"In setting up the Lighting Center," he continued, "our problem was to make fluorescent lighting attractive in a typical home setting so that it would harmonize with the other decorations. Color of the walls and furnishings were taken into consideration, and lamps and fixtures, styled to present a pleasing appearance either lighted or unlighted, were installed. Moreover, all the lighting at the Center is within the price range of the average family."

One of the outstanding features of the rooms is the successful use of both fluorescent and incandescent light sources. Both are used in the living room and bedroom and the combination presents a soft, pleasing effect as well as providing adequate light for any task. New lines, crisp detail, and nicety of finish mark the fluorescent fixtures. Several new materials have been used in designing them with the result that, while the lighting itself provides good seeing, the fluorescent fixtures harmonize perfectly with customary incandescent fixtures besides following the mood of the other furnishings.

Kitchen Lighting

In the kitchen, where, according to the recent survey, modern lighting is most in demand, continuous strips of fluorescent lamps have been mounted on the ceiling over the work surfaces. The unit follows the contour of the surfaces, with light coming down on the areas where food is prepared.

The lamps create a soft, even light, with virtually no shadows throughout the entire room, and this flexible type fixture will probably become a major appliance in postwar kitchens. A new development in illumination for the kitchen, the lighting creates a bright, cheerful atmosphere in which to work. *(Con't on page 103)*

Maintaining Industrial Electrical Equipment

Part 8—Lighting*

THE importance of good light in industrial plants has a direct bearing on the quality and speed of work. Important, too, is the fact that good lighting has a great influence on employee morale. Plants that have a regular time to check up and clean lighting equipment find this practice is an indispensable part of their plant operation.

With proper maintenance, the average plant can obtain at least one third more light than with conventional maintenance methods, and without any additional purchases of critical materials, power, or lamps.

It has been estimated that one man, working continuously, can clean and relamp fluorescent reflectors that provide light for approximately 60 workmen. If the increased light which the maintenance man provides, through cleaning and relamping, increases the personal effectiveness of these 360 men only 0.28 per cent, the maintenance man's time has been accounted for.

Lighting maintenance consists of replacing lamps, cleaning lamps and reflectors, and maintaining proper voltage conditions. When the cost of maintenance is properly considered in relation to the cost of the entire installation, it will be found that frequent cleaning of reflectors is the most economical method of obtaining higher-than-average light output.

Group replacement of lamps in a lighting system often can be justified by a reduction in the labor cost of replacement. This method of lamp replacement requires that the original group of lamps be left intact until 80 per cent of their average life has been reached. By this time, 20 per cent of the original group will have failed, and the balance will have delivered 83 per cent of all the light they can deliver. At this point it is often less expensive to replace the entire group and discard all the lamps because the value of the useful light remaining in any lamp is that less than the cost of replacing the lamp individually. There are, however, some circumstances where group replacement may not be practical.

Fluorescent lamps offer the best opportunity for group replacement. Since a large number of lamps usually provide the illumination at any given location, individual outages do not seriously affect the light in adjacent areas. The lamps that have failed can wait for replacement until the time of the next group-replacement period.

If, in a large area, all of the lamps are operating at essentially the same voltage for the same length of time, group replacements may be practical because lamp life will be reasonably uniform. However, when the light output per lamp is high, an outage may leave the nearby floor area relatively dark. In cases of this kind, group replacement is not practical.

Group replacement of mercury lamps is impractical in most cases because of the high output per lamp, as well as the high unit cost. In addition, it is not easy to determine the lamp life.

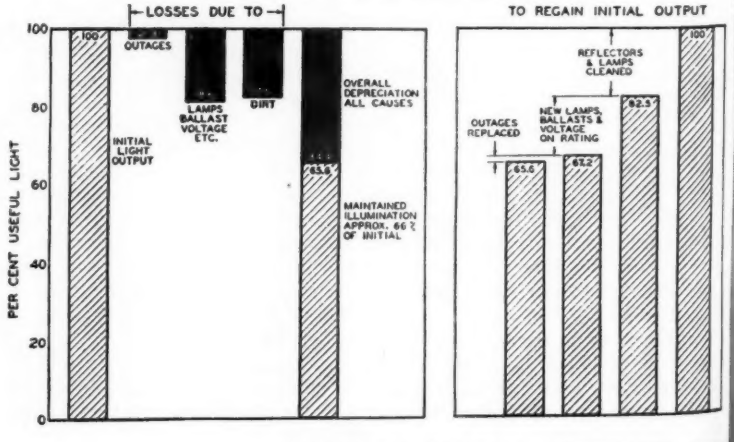
Today many plants are faced with the problem of creating "production lighting" levels of 20, 30, or 50-foot-candles for three-shift operation with a wiring system designed for only one or two watts per square foot. Where filament lamps are retained, in some cases the panelboard voltage has been doubled and 115-volt lamps operated two in series. This essentially doubles the illumination that can be obtained from a given wiring installation.

Where fluorescent or mercury lamps are replacing filament lamps, the voltage can also be doubled, using 236-volt ballasts or transformers. But the resulting illumination will be quadrupled, since the fluorescent or mercury lamps are twice as efficient as the filament lamps. In this way, reasonably modern lighting levels can be had without necessarily rewiring the plant.

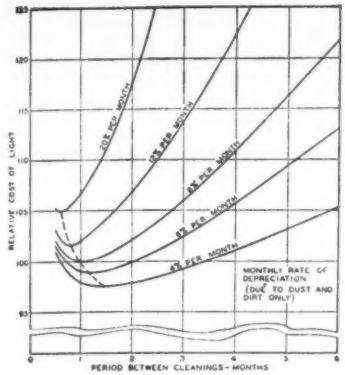
Many cleaners and detergents are suitable for cleaning lighting equipment. In general, since porcelain enameled, mirrored glass and prismatic glass reflectors all have glass surfaces, the strength of the cleaner in most cases will not harm the surface; for example, alkaline compounds are frequently used. However, care must be taken in cleaning aluminum reflectors, since an alkali will tend to attack the metal. Neutral detergents or special wax or wax-emulsion cleaners which have been developed specifically for cleaning aluminum are recommended.

It is suggested that the plant engineer consult representatives of companies which manufacture industrial

A survey of 27 fluorescent lighting installations indicated: at left, various causes of depreciation in light output; at right, how the light as found could be restored to its initial efficiency.



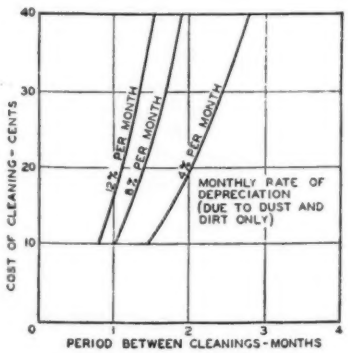
*This article is adapted from information prepared by engineers of the General Electric Company.


RELATIVE COST OF LIGHT
PERIOD BETWEEN CLEANINGS - MONTHS
12½ PER MONTH
8⅓ PER MONTH
6¼ PER MONTH
5 PER MONTH
4% PER MONTH
MONTHLY RATE OF DEPRECIATION (DUE TO DUST AND DIRT ONLY)

With the aid of this chart, it is possible to determine the most economical period between cleanings. Since the collection of dirt varies, the dotted line shows when the reflector should be cleaned in relation to dirt accumulation. (Based upon a cost of 10 cents per cleaning.)

cleaners. Such representatives are well acquainted with the various types of dirt found in plant interiors and the specific cleaners which will be most satisfactory.

Tungsten-filament lamps are designed to produce the greatest amount of light for the lowest cost (at average industrial-power rates) when operated at the voltages for which they are designed. Operating lamps *at higher* voltages than those for which they are designed, will result in increased lamp efficiency, but with a sacrifice in length of life—which increases the lamp-replacement problem. Undervoltage operation increases life, but sacrifices lamp efficiency—which results in an increased cost of light. A 5 per cent decrease in voltage results in approximately 16 per cent loss of light. Poor lighting can often be traced to gradual load increases that have decreased socket voltages.


COST OF CLEANING - CENTS
PERIOD BETWEEN CLEANINGS - MONTHS
12½ PER MONTH
8⅓ PER MONTH
4% PER MONTH
MONTHLY RATE OF DEPRECIATION (DUE TO DUST AND DIRT ONLY)

With the aid of a simple chart, it is also possible to determine the most economical periods for cleaning at various cleaning costs.

TROUBLE-SHOOTING CHART

FLUORESCENT LIGHTING

Starting Difficulties*

TROUBLE	CAUSE	REMEDY
Blinking, on and off, of an old lamp (Often accompanied by "shimmering" effect).	Normal failure due to exhaustion of active material on electrodes.	Replace lamp promptly.
Blinking, on and off, of a relatively new lamp (One factor or a combination of factors may cause blinking of a relatively new lamp. Under limiting conditions of starting or operation, replacing either a lamp or starter with one of slightly different rating may temporarily correct a difficulty from some other cause. Therefore, careful consideration should be given to all the various factors in case of unusual difficulty.)	Lamp may be at fault.	Replace lamp. Investigate lampholders.
	Defective starter may cause blinking or prolonged flashing at each start.	Replace starter.
	Low-temperature operation.	Use special low-temperature lamps.
		Keep voltage up. Use thermal switch auxiliaries.
	Ballast low in rating.	Check ballast and replace if necessary.
	Cold drafts.	Enclose lamps.
	Loose circuit contacts (likely at lampholders).	Make sure that lamps are securely seated and lampholders are rigidly mounted.
	Low circuit voltage.	Check voltage and boost if possible.
Lamp makes no starting effort	Improper circuit connections.	Check wiring and connections.
	Lamp not making proper contact.	Check prongs and sockets to see that they are not broken.
	Starter may not seat properly in starter socket.	Try another starter. In new installation, starter socket may be at fault.
	Lamp has open electrode circuit.	Replace lamp.
	Lamp has leaked air.	Replace lamp.
	Starter has reached end of life.	Replace starter.
	Ballast defective.	Replace ballast.
	Improper wiring.	Make proper connections.
Lamp is slow in starting	Sluggish starter.	Replace starter.
	No starting compensator in leading branch of two-lamp ballast circuit.	Install compensator in series with leading circuit starter. (65- and 100-watt two-lamp ballasts need no compensators.)
	Low line voltage.	Check voltage and correct if possible.
Ends of the lamp remain lighted	Low ballast rating.	Replace ballast.
	If new installation, wiring connections may be incorrect.	Make proper connections.
	Short circuit in starter. (Starters in use for some time may fail in this way.)	Replace starter.

* Use of "no-blink" starter will minimize annoyance or possible damage to lamp, starter, or ballast. If a "no-blink" starter is not used, lamp or starter should be removed as soon as blinking on and off begins to avoid possible damage.

Lamp Performance

Early end blackening*	Omission of starting compensator where required.	Install a compensator.
	Defective starter causing blinking, prolonged flashing, or ends of lamp to remain lighted.	Replace starter.
	High or low voltage.	Keep voltage within ballast rating.
	Loose contacts (most likely at lampholders), causing lamp to blink.	Lampholders should be rigidly mounted and properly spaced. See that lamps are securely seated.
	Improperly designed ballasts or ballasts outside specification limits.	Use of approved ballasts will usually eliminate troubles of this nature.
Normal end blackening*	Normal development throughout life. Appears at one or both ends. Usually extends 2 or 3 inches from base.	
	Mercury deposit at ends.	Should evaporate as lamp is operated.
Dark streaks lengthwise of lamp tube	Small globules of mercury collecting on lower, or cooler, part of tube.	Rotating lamp 180 degrees in lampholders may favor evaporation, although mercury may condense out again.
Brownish ring at one or both ends*	Frequently a natural development.	Replace lamp if appearance is too objectionable.
Dense black spots near ends of lamp	Usually about ½ inch wide and centered about 1 inch from base. Normal development if occurring late in life, but if early in life, indicates excessive starting or operating current.	If early in life, check for ballast off rating or unusually high circuit voltage.
Short life	Effect of mortality laws. Some lamps may fail after a few hundred hours. Will be balanced by others that live longer than rating.	
	Frequent starting.	Rated life should be obtained on the average if lamps are operated for normal periods of three or four hours.
	Excessive under- or overvoltage.	Maintain voltage within ballast rating.
Burned-out electrodes (Insufficient current can be drawn from the ballast to burn out the electrodes under normal conditions.)	Improper ballast equipment for direct-current operation.	Use special ballast equipment designed for that purpose.
	Grounded starter socket, grounded lead, wire of stranded lead touching grounded fixture, broken socket.	Correct the fault.
	Connecting direct to circuit without ballast.	Install proper ballast.
Flicker (swirling, spiraling, and snaking)	New lamp may flicker in this manner when first placed in service.	Will usually clear up after lamp has been operated for short period or turned on and off a few times.
	Lamp starting with improper electrode preheating.	Replace starter.
	Omission of starting compensator necessary with certain two-lamp ballasts.	Install compensator.
	High-voltage starting.	Check voltage.
	Starting the lamp with improper auxiliary equipment.	Use approved equipment.

* At the end of their life, lamps usually show a dense blackening at one or both ends. Also, there may be dark rings slightly brownish in color at one end or both. On the average, there should be little indication of either blackening or rings during the first 500 hours.

Normal ambient temperatures have relatively little effect on filament-lamp efficiency. However, under extreme conditions of improper usage, certain difficulties may be encountered. These are: bulb blistering, loosening of the base, deterioration of the socket parts, and thermal cracks due to localized cooling when fixture parts are allowed to touch or hang on lamps. Occasionally violent failures of lamps occur because of thermal cracks. Such conditions are more often encountered with specialized lighting equipment for hazardous locations, spot lighting, floodlighting, and radiant-energy heating than with equipment for general lighting.

Premature failures of general lamps for lighting (soft glass) often occur if they are located where rain, snow, or bugs can strike them. Such lamps should be protected by screens or glass cover plates. The use of hard-glass lamps, such as the 150-watt PAR-38 projector, spot, or floodlight lamps, will usually eliminate such failures.

The Underwriters' Laboratories have classified hazardous locations and have specified recommended types of lighting equipment for such locations.

TYPE OF EQUIPMENT	MOUNTING HEIGHT			
	Up to 12 ft	12 to 18 ft	18 to 30 ft	Above 30 ft
Catwalk or truss	...	...	x	x
Crane, where available	...	...	x	x
Crow's-nest ladder	...	...	x	...
Disconnecting hanger	...	...	x	x
Portable maintenance platform	...	x	x	...
Relamping bridge	...	...	x	x
Stepladder	x	...	...	...
Straight ladder	...	x	...	...
Telescoping platform, elevating tower, etc.	...	x	x	...

Locations where dust or dangerous gases may be encountered call for properly designed reflectors. Bare lamps should never be used in hazardous locations.

Mercury lamps for industrial service are principally the 400-watt H-1, and the 3000-watt H-9. Because of the great preponderance of 400-watt lamps, the following points refer particularly to this lamp:

The light output of mercury lamps varies with voltage in approximately the same ratio as tungsten-filament lamps. Mercury-lamp transformers for the 400-watt lamp are equipped with four taps which permit proper adjustment to various line voltages. However, it is highly desirable that the line voltage vary less than 5 per cent plus or minus from the tap setting. It is desirable because of other features of mercury-lamp performance besides life. There is no definite relation between the life of a mercury lamp and the operating voltage or light output, as is the case with filament lamps. However, unsatisfactory performance may result if the transformer tap setting is not within 5 per cent of the outlet voltage.

Voltage dips of more than 10 per cent often cause the lamps to drop out of the circuit. However, if the leading lamp is operated by a Tulamp transformer, operating two lamps out of phase from a single-phase source, it can withstand a greater voltage drop than the lagging lamp, or a lamp which is operated from a single-lamp transformer.

If, for any reason, a lamp should drop out of the circuit, it will require a cooling period of seven to eight minutes before it will restart and an additional seven or eight minutes before it will deliver full light output.

Likewise, on a cold start, lamps on the lagging circuit of a Tulamp transformer or a single-lamp transformer will require from eight to twelve minutes to reach full light output, while the leading lamp of a Tulamp transformer may require from fifteen to twenty minutes. These restarting values apply specifically to the H-1 lamp. The H-9 lamp (with single lamp transformers only) possesses somewhat more rapid starting and restarting characteristics: three minutes and seven minutes respectively.

For the above reasons, mercury lamps should never be installed unless the power supply is highly reliable and not subject to sudden drops caused

Trouble Shooting Chart — Fluorescent Lighting

(*Continued from preceding page*)

Light Output

TROUBLE	CAUSE	REMEDY
Rapid initial depreciation in light output	Normal loss during first 100 hours may amount to as much as 10 per cent. (Light output at 100 hours used for rating.)	
Decreased light output	Cold drafts.	Enclose or protect lamps.
	Operated at too high a temperature.	Better ventilation of fixture.
	Low temperature. (Below 65 F the light output may drop 1 per cent or more per degree.)	Enclose lamp or conserve heat by other means.
	Low circuit voltage (about 1 per cent drop for each per cent undervoltage.)	Maintain voltage.
	Dust or dirt on lamp fixture, walls, and ceiling will reduce illumination level.	Clean at regular intervals.
Color differences	May be due to reflector finish, wall finish, other nearby light, room decoration.	Interchange the lamps before forming a conclusion.
	Differences in manufacturing tolerances of white and daylight lamps may be discernible to the eye, although the difference should not be objectionable.	
Dark section of tube on direct current	Longer lamps especially may develop a region one third to one half the length of the tube which emits no light. It is due to current flowing only in one direction.	Install reversing switches and reverse connections in circuit about twice a day.

Miscellaneous

Radio interference	Bulb radiation.	Locate aerial at least 9 feet from the lamp if possible. If not, shield aerial lead-in wire, and provide good ground, or keep the aerial itself out of bulb and line radiation range.
	Line radiation.	Apply line filter at lamp or fixture.*
	Line feedback.	Apply line filter at lamp or fixture.*
Hum	Inherent magnetic action in ballast. It is aggravated when these vibrations are transferred to channel or supporting members.	Mount ballasts on soft rubber or other damping material.

* In certain cases it may be possible to minimize radio interference by applying filters at the radio power outlet or at the circuit panel box.

by irregular heavy loads on the circuit. Mercury lamps are often installed in combination with filament lamps to provide an improved color of light. They also assure some illumination during the blackout period if the mercury lamps should drop out because of a momentary power interruption or voltage dip.

Mercury lamps are designed to start with ambient temperatures as low as 10 F for the H-1; 32 F for the H-9. If lower temperatures are expected, the lamps should be enclosed with a certain amount of filament lighting to warm the enclosure and permit starting and building up to full light output.

The primary requirement of any method of reaching the lighting equipment is to get the maintenance man, his cleaning and relamping materials and the fixtures together, so that he can work safely and conveniently. The accompanying table indicates the most common methods in use today.

When fixture spacing and building structure permit, the lighting equipment can be mounted on special catwalks or on catwalks built on trusses. The fixtures are normally mounted in such a way that no light is intercepted by the catwalk. When the reflector is to be cleaned or relamped, it is swung from its normal position in toward the catwalk to a position in which it can be easily maintained.

Where maintenance of rigidly mounted fixtures is done from a crane, the crane should be equipped with a safe platform from which the maintenance man can conveniently reach the lighting equipment mounted approximately six feet above the platform.

The crow's-nest ladder is equipped with a small platform upon which the maintenance man can stand. He usually straps himself to the platform to eliminate the possibility of falling. The ladder is mounted on a heavy, portable base which can be wheeled through the factory. The ladder can be swung through 360 degrees, and, because of its overhang, reaches reflectors located over machines or stock bins. Hooks, clamps, or boxes can be attached to the ladder to hold the spare lamps and cloths that are needed.

Disconnecting hangers permit the fixture to be lowered to the floor by a chain or cable for maintenance. The electrical connection is broken when the fixture is lowered, making the fixture safe to handle while on the floor. Hangers have been adapted not only to individual reflectors, but also to continuous rows of fluorescent reflectors. With extremely heavy loads, such as a continuous-row fixture, it is

(Continued on page 46)

Instant Starting for Fluorescent Lamps

By D. P. Caverly
Commercial Engineer
Sylvania Electric Products, Inc.

EVER since fluorescent lamps first became commercially available, there has been a demand for a circuit which would start them without the customary cathode preheating time as provided by a time delay switch called a starter. While there are several ways to accomplish this, the major problems have been to do it without appreciably affecting the life, light output and general performance of lamps, and without consuming too much power in the equipment.

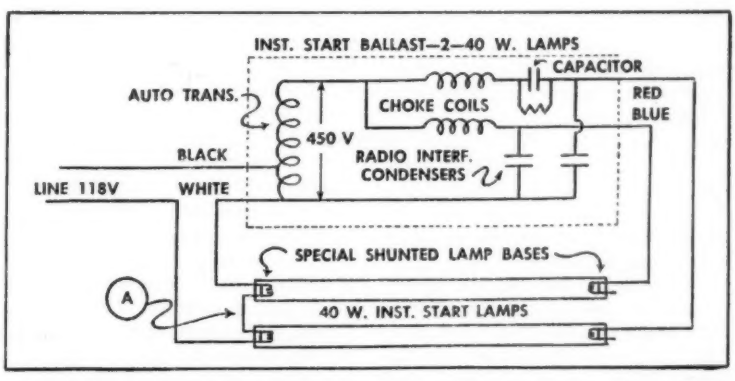
The usual starting method involves cathode preheating for a few moments and then, as the starter opens the circuit, an inductive surge occurs for an instant which may be in the order of 1000 volts. This inductive surge is sufficient to ionize the column of gas in the lamp so that current (as limited by the ballast) flows through it at 108 volts while the lamp remains lighted (40W lamp).

In the instant starting circuit there is no inductive surge since the circuit is not opened by a starter, but sufficient voltage must be supplied to start the lamp. Such a starting voltage in a 40-watt lamp is approximately 440-450 volts. This is supplied by the instant starting ballast to start the lamp, after which the operating voltage is maintained at about 108 volts as in the standard circuits.

Under the starting conditions described in the previous paragraph, ordinary lamps may not start if humidity conditions are high. The reasons for this behavior have not been thoroughly established, but it is well known that if a film of moisture of sufficient density exists on the outer bulb wall, it may prevent ionization and proper starting of the lamp if the impressed voltage is only 450 volts, as in the case of the instant starting circuit. The inductive surge of the standard circuit, being about twice as much, is sufficient to overcome this condtiion. Thus the problem of instant starting is increased as humidity conditions are increased.

To overcome these various problems of instant starting, Sylvania has developed a 40-watt lamp which will have the following special features for operation on instant starting circuits:

1. The lamp will be identified as instant starting in the etching.
2. It will utilize cathodes designed specifically for instant starting characteristics.
3. The exterior surface of the glass tube will be coated with a specially developed hydrophobic coating which will prevent the formation of a moisture film. This coating cannot be detected visually, will not rub or scratch off, and in no way affects the light output of the lamp.
4. The base pins of this lamp will be short circuited inside the plastic base, thus making possible the use of standard lampholders, but safety rules of the Underwriters' Laboratories require that the primary circuit be wired through lampholders as shown in the diagram at "A," so that the primary circuit is broken whenever either lamp is removed.



Circuit for instant-starting fluorescent lamps. The starting auto-transformer provides approximately 450 volts. After starting, the operating voltage is maintained at about 108 volts as in the standard circuit. Safety rules require that the primary circuit be wired through the lamp holders as shown in the diagram at "A" so that the primary circuit is broken whenever either lamp is removed. (Reprinted from Sylvania Lighting News.)

These instant start lamps will be available only in the 40-watt T-12 size at present. They are not interchangeable with standard lamps on standard circuits. Their ratings will remain the same as standard lamps. Prices and other sales data will be released shortly through the proper channels.

The diagram shows the internal hook-up of a typical instant starting ballast. Some manufacturers reverse the identifying colors of the line leads indicated, or they may all be black. When making connections always be sure to check the wiring diagram usually printed on the ballast case.

"Levels of Lighting" Replaces "Foot-candle"

A NEW LIGHT meter, literally as simple as ABC, which would substitute "levels of lighting" for the confusing "foot-candle" terminology of engineers, has been offered as a method of simplifying the approach to home lighting.

Developed by Miss Myrtle Fahsbender, director of home lighting at the Westinghouse Lamp Division, Bloomfield, N. J., the new meter has lighting levels graded alphabetically from A through E, as well as comparable foot-candle readings.

Miss Fahsbender said the term "foot-candle" is the proper illuminating engineering designation for the measurement of quantity of light, just as "degree" is used in the measurement of heat. But, she added, the term should be handed back to engineers and scientists for their use because its inclusion in consultations with housewives has created "needless lengthy and too frequently confusing technical discussions between the homemaker and home lighting consultant."

The need for a simplified home lighting technique, Miss Fahsbender reports, was affirmed in a survey conducted among power companies.

Illustrating how the new method would work, Miss Fahsbender listed "levels of lighting" in tabular form keyed to recently-established foot-candle values recommended for residential lighting by the Illuminating Engineering Society.

For example, she said, "a homemaker asks advice on the amount of light needed at a chair where reading is done for casual periods of time. The home lighting consultant, being governed by the recommended table, would determine the correct level of lighting for that specific home seeing task and recommend accordingly. Casual periods of reading are classified in the table as requiring "Level C" lighting.

"It is the consultant's job to recommend the proper lamp and its correct placement so that Level C lighting is provided. In this way, the lighting consultant has provided a quantity of light within the recommended foot-candle range without discussing the term."

For the most critical eye task listed, fine needlework on dark goods, the IES recommends 100 foot-candles or more. This becomes Level A lighting in the home lighting consultant's discussion with the homemaker.

For reading small type for prolonged periods, or for a children's study table, or for work areas in the kitchen, the IES recommends 40 foot-candles. This becomes Level B lighting. Writing tasks, calling for 20 foot-candles, becomes Level C lighting.

General kitchen lighting, 10 foot candles, becomes Level D lighting and, at the bottom of the list, where the IES recommends five foot-candles for general lighting in the entrance hall, stairways, dining room, bedroom, bath room and living room, Level E lighting would be recommended by the home lighting consultant.

"Lack of understanding," Miss Fahsbender reports, "has retarded a more rapid acceptance of home lighting practice. With 'levels of lighting' added to the vocabulary and the new light meter tailored to illustrate these levels," she added, "it will be possible for the homemaker and the home lighting consultant to discuss residential lighting on an understanding basis. From this should come an intelligent acceptance of the vital relationship between light and sight."

Miss Fahsbender emphasized that while levels of lighting referred only to quantity of light, the quality of light is of equal importance and must be given due consideration. Quality of lighting means, she explained, "the absence of annoying shadows, glare and excessive brightness, contrast as well as color, decorative appearance, and any other factors involved in providing a completely satisfactory solution for the homemaker.

"It is our feeling," Miss Fahsbender observed, "that with an awakened realization of the real import of better light-better sight, no mother will long tolerate the outrages now existent against her children's eyes. In addition, no homemaker will overlook the comfort, convenience and attractiveness which is possible in decoration through the medium of artificial light."

Maintaining Industrial Lighting Equipment

(*Continued from page 45*)

desirable to provide a counterweight, or handle the load with specially designed winches.

Rigidly constructed portable maintenance platforms are widely used in plants when the mounting height is uniform and when space is available for the platform. These can be had either as single-tower units or, in some cases, as twin towers connected by a rigid framing upon which the man can walk. The latter is particularly suitable to a continuous-row fluorescent installation where a single setting of the platform permits easy maintenance of a number of fixtures.

In plants where cranes are in continuous operation, or where there are monorails but no traveling cranes of the usual type which could be employed for reflector maintenance, the craneway or monorails can be utilized for relamping purposes. Relamping bridges are light structures that span the craneway and are towed to position under a row of reflectors. The bridge is left at this location until the reflectors have all been cleaned and/or relamped, and is then moved to the next position. This type of equipment is also well suited for group replacement of lamps.

For relatively low mounting heights, stepladders are extensively used because of their convenience and portability. Even with such simple devices it is desirable to provide special clips, hooks, and/or boxes on the ladder which provide storage for spare lamps and cleaning cloths. Thus, the maintenance man is able to do the entire cleaning and relamping job on one trip up the ladder.

Where such maintenance methods are planned, it is desirable to have disconnecting fixtures in order that the reflector may be disconnected and taken to the floor for cleaning and relamping. A more thorough cleaning usually is done when the man is safely on the floor than when standing on a ladder, and there is less possibility that the cleaning solution or rinse water may splash on expensive materials which are being processed below.

Under certain conditions, standard straight ladders can be modified to meet specific reflector-mounting conditions. For example, a lightweight brace which allows the maintenance man to reach the row of reflectors more conveniently can be added.

Telescoping platforms are often used for lighting maintenance. Such units are small when nested.

Postwar Goals for Light Sources

By Samuel G. Hibben

Director of Applied Lighting, Westinghouse Electric Corporation, Bloomfield, New Jersey.

AMONG MANY of the problems receiving constant attention in the research laboratories are the very vital ones of transferring electrical energy directly to radiant energy without the intermediate step of heat. The objective is old, but several recent approaches are new. When this war began, some 95 per cent of the man-made light sources were tungsten filament lamps having their optimum economic light emission when the filaments were operated at a temperature of approximately 3,000 degrees Kelvin, and whereof the heat losses were on the order of 90 per cent of the input energy. This did not seem good enough.

The commercial Mazda filament lamp with its efficiency of some 14 lumens per watt where 7.5 per cent of the input energy is converted into radiation to which the human retina responds, may well remain a standard article for household use and for small wattage local industrial lighting equipment, but the urge for interior large scale lighting and for illumination levels on the order of 50 to 100 foot-candles demand that higher efficiencies be attained. How high are our hopes?

Fig. 2. This 10,000-watt mercury vapor lamp, so brilliant this picture had to be taken through a special glass filter screen, radiates enough heat to light a cigarette held near it, although the quartz tube in which the light is generated is cooled by a continuous flow of cold water. Mr. Hibben, the author, holds the cigarette.

Fig. 1. The "cold light" of a firefly is reproduced in a pitcher during a lecture by the author.

Romantically, the scientist turns again to studies of the firefly, of luminescent bacteria, and of chemiluminescence or bioluminescence in nature. It is roughly estimated that 90 per cent of the radiant emission from a firefly is luminous, closely approaching 500 lumens per watt. (Figure 1). This is ten times the ultimate efficiency that could be expected from a tungsten filament lamp since tungsten when melting at about 3,655 degrees Kelvin could generate visible light at no better than 55 lumens per watt. If such a lamp were to burn for several hours, an efficiency of 35 lumens per watt would more correctly represent the upper limit.

Like the firefly, most of nature's lamps produce light by oxidation. No energy whatever is wasted in the production of invisible ultraviolet light and practically none in heat radiations. Man's latest lamps willy nilly generate much of both.

It appears that nature's illuminants developed simultaneously with nature's seeing organs. The luminous emission from a typical insect like the firefly is confined to a very narrow band of wave lengths, concentrated at the central point of the visible spectrum or at the light yellow-green color region (5700 A) where the response of the retinal nerves is most sensitive. Little or nothing is lost in emitting red or blue colors. By contrast, man's illuminants, particularly those of the hot body, or incandescent types, emit a great deal of light at the long wave and also the short wave ends of the visible spectrum, and it is this radiation which, in addition to the infra-red and ultraviolet, is generally wasted so far as seeing is concerned.

From a study of the color response characteristics of the human retina we might conclude that the sodium vapor lamp for instance which concentrates practically all of its luminous output at a wave length of 5890 A (lemon yellow) would be the best light source for general purpose seeing. However, a study of this and other almost monochromatic lamps indicates one further difference between nature's illuminants and man's. The purpose of the latter is to make surrounding objects visible by light reflection therefrom, whereas nature's lamps are primarily to be seen as signals, or markers, or lures. Man's seeing judgment depends to a large extent upon the color of the object being viewed and hence a monochromatic source with its resultant distortion of object color fails to meet our broad criteria for the ideal illuminant of tomorrow.

When we employ the energy of electricity to displace or excite the outer-most electrons of the mercury atom within the commercial tubular fluorescent lamp thereby generating short wave ultraviolet radiations, and when this radiation in turn upsets the normal atomic arrangement of the phosphor crystals coated on the inside of the glass tube, we have achieved a "short-circuiting" light making process, i.e., we eliminate the production of much heat. By this method some 18 to 20 per cent of the input energy is converted to usable light. This still seems not good enough.

An arc discharge through high pressure mercury vapor ranging from 1 to perhaps 80 amospheres (but commercially at about 3 to 5) develops luminous radiation at a commercial efficiency on the order of 65 lumens per watt. (Figure 2). This is better, and further research will increase this efficiency in proportion as we can increase the temperature and pressure of the mercury vapor. The problem here is the refractory characteristic of the container. Summing up the situation we then have this analysis:

1. Tungsten filament illuminants now developing some 15 lumens per watt and practically limited to 35 or to a theoretical and ultimate maximum 55.

2. The fluorescent lamp, now developing some 45 to 60 lumens per watt and capable of doing roughly twice as well, as the technique of developing 2537 A ultraviolet from mercury vapor and of efficiently exciting phosphor crystals therewith is perfected.

3. High pressure metallic vapor discharge lamps now producing 55 to 70 lumens per watt and theoretically capable of going considerably higher in efficiency if refractory containers could be had so as to permit increases in temperature that accompany pressure beyond roughly 5 atmospheres.

These, then, are some of the present day problems in lighting research that seem to offer a challenge to the engineer who recognizes that postwar lighting requirements will demand vastly more artificial illumination than man has heretofore enjoyed.

Anderson's Electrical Department Store

(*Continued from page 38*)

wide demand and one of their best sellers has been a yard post lantern. They stock special lighting fixtures for den, bedroom and breakfast room.

Competent floor salesmen have been developed during the war and their importance evaluated. Competent sales people who have studied the line and know the possibilities are a must, Mr. Anderson said.

To get competent people, the pay and working conditions must make it worth while for them to prepare themselves for the business. Mr. Anderson said his salaries started where the department stores left off and that he added an incentive bonus on the basis of sales in addition.

For their new postwar electrical department store, this sales training idea will be worked out still further with sales people being qualified for certain departments. The customer will, in effect, be handled by experts in each department he visits. These experts will know all the answers and will welcome questions by the customer.

One of the things that loses customer confidence quickly is for the customer to find out the store does not know much about what it is selling, Mr. Anderson said. "This is common, however," he continued. "Go to a hardware store and buy a knife and ask the clerk what kind of steel is used for the blade and what the handle is made of and it's a hundred to one that he doesn't know. Our clerks will (and do now) know what the materials are, what the uses of the fixture are, what it costs to hang it and all other facts pertinent to the merchandise."

Anderson Electric and Supply Company is a 21-year-old concern owned by W. T. and A. K. Anderson.

The war and a disastrous fire hit them about the same time. They were burned out in 1941. Formerly their biggest business was in electric wiring. When the war and the fire came along they changed their merchandising picture and went more heavily into lighting fixtures. They experimented with a line of art goods and glassware which they sprinkled through the stock. They decided this was not for them.

Honesty in advertising, competent sales people, and a large variety are the things that put the lighting department over in a big way and the things which will occupy a leading role in their new postwar electrical department store.

Opportunities Ahead In Lighting!

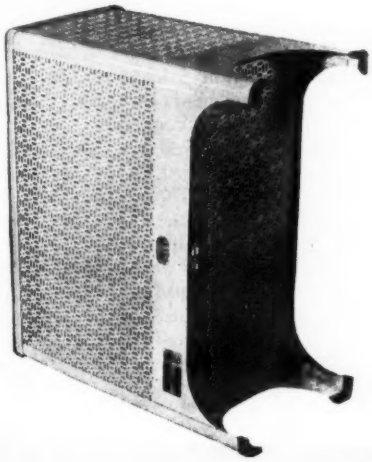
(*Continued from page 31*)

We should back up the National Adequate Wiring Bureau in telling the story of properly wired homes; for comfort, for convenience, for adequate, easy-on-eyes lighting. And we might work more closely and harmoniously with architects and building contractors for the specification of good lighting and the incorporation of sufficient "lighting" allowances in contracts, etc.

Both wholesalers and dealers will need to study, will need to go back to school, as it were. "Know your product and its use" will be more than a catch phrase. The postwar salesman will have to "know" in order to supply sound illuminating engineering service. And the higher cost of better installations makes it important that they be properly engineered, or results may not justify the investment.

Fortunately educational programs of greatly expanded scope are contemplated or have been announced by the Illuminating Engineering Society, National Better Light-Better Sight Bureau, Better Vision Institute, American Home Lighting Institute, The National Lamp and Shade Institute, Certified Lamp Makers, Small Homes Council, Home Planners' Institute, National Adequate Wiring Bureau, National Electrical Wholesalers Association, Edison Electric Institute, and National Society for the Prevention of Blindness, the lamp companies, quite a few utilities, some optical equipment manufacturers, a number of insurance companies, many lighting fixture manufacturers, national magazines, ELECTRICAL SOUTH and other trade papers. Many colleges are adding to or improving courses offered in illuminating engineering. Knowledge will be available to all who wish to use it.

Improved school lighting, street lighting, and outdoor lighting for recreation and selling are markets which can be viewed optimistically. They will share in the general prosperity.



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RURAL SALES—A Challenge to the Appliance Dealer

APPLIANCE dealers in the South are faced with the direct challenge of helping farmers to get productive and household electrical appliances. They can expect a good deal of assistance from their manufacturers, wholesalers, and the light and power companies. In addition, according to a new policy just announced by the Rural Electrification Administration, the dealer can count upon the active cooperation of the co-ops—the rural electric cooperatives.

If dealers fail to meet this callenge, they may find the co-ops in the merchandising field. In a booklet entitled "Helping Farmers to Get Equipment," the REA points out that the directors of the co-ops have a two-fold obligation: making electricity available, and promoting its use. To accomplish the latter objective, equipment must be made available to the co-op customers. REA points out that this can be accomplished in two ways: (1) by relying on commercial dealers and, (2) by merchandising through distribution co-ops especially incorporated for merchandising.

"When independent dealers in the areas of a system are sufficient in number, carry needed lines at reasonable prices, and service effectively the electric equipment they sell, reliance on such dealers is unquestionably the best as well as the safest policy for a co-operative," advises the Rural Electrification Administration in its policy-making booklet. "The co-operative can bring its influence to bear by stimulation of dealers to carry sufficient lines, sell at reasonable prices, and provide for proper servicing.

"Collaboration by a distributing cooperative should be impartial, with all dependable dealers and not with a selected few. It can be expressed in many ways: by conferences at which is fully explained the potential market represented by members, how wide a range of equipment will be in demand, the varying degrees of saturation of the various items—even the names of members for circularizing purposes if given to all dealers alike. Space in cooperatives' offices can be offered for display of dealers' samples. It is especially necessary that dealers be stimulated to make adequate provisions for servicing, and the dependability of each in this respect, should be a matter of observation and stimulation. The attention of dealers should be called to the possibility of financing members' purchases on an installment sales basis through Section 5 loans of REA by special arrangements through the electric distribution cooperative.

"In some areas distribution cooperatives feel compelled by circumstances to assume the risks of merchandising electric equipment. There may not be a sufficient number of private dealers; those that exist may not carry an adequate number of items and may fail to respond to the suggestion of the cooperative that they enlarge their lines; prices may not be favorable; servicing may be neglected. Serv-

Rural electrification experts say that an appealing display center offers one of the best opportunities for promoting appliance sales among rural prospects. Displays should show productive appliances and household units.

A Tribute

to all those who helped in the greatest scientific achievement of all time... the

ATOMIC BOMB

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For the inspiration and leadership displayed by the Executive, Military, and Naval authorities... to the Scientists... Engineers... to Labor, and to those Companies that played a part in this unprecedented achievement, General Cable voices the sentiment of America in extending highest praise and heart-felt appreciation. Because of their scientific genius, their untiring effort and their complete devotion to this gigantic task, Victory comes sooner and all mankind benefits.

General Cable Corporation is also justly proud of the contribution made by its own staff in the engineering development and manufacture of still secret and exceedingly special materials essential in the production of this device of war... and of Peace.

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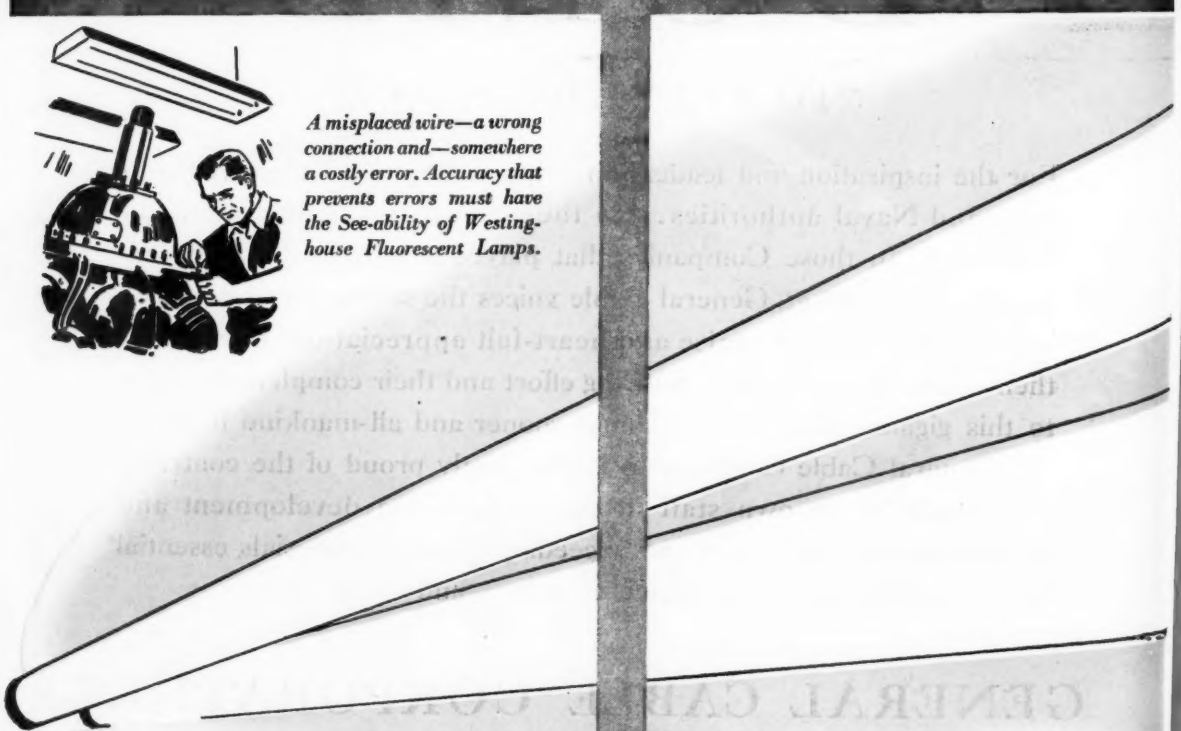
Eyes like these must be sure. And they are sure—without strain or fatigue—because See-ability makes every adjustment clear and sharp, helps maintain high speed efficiency.

Draughting is an art that reaches its peak only under the finest lighting conditions. Westinghouse Fluorescent Lamps provide the See-ability that work like this demands.

A misplaced wire—a wrong connection and—somewhere a costly error. Accuracy that prevents errors must have the See-ability of Westinghouse Fluorescent Lamps.



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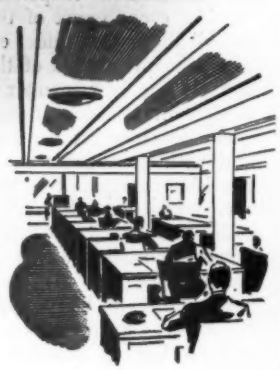
Today—in every branch of industry—Westinghouse Fluorescent Lamps are meeting industry's lighting needs—are providing invaluable aid to every seeing task where speed and precision are prime production factors. Alert dealers are building prestige and profits on the firm foundation of an adequate supply of these dependable lamps.

Throughout industry—wherever you go—industry is demanding top grade lighting. Sell Westinghouse Fluorescent Lamps and meet this demand —completely!



Office workers respond to the better See-ability of Westinghouse Fluorescent Lamps. More contentment —more speed—fewer mistakes when the lighting problem is solved.

Westinghouse

PLANTS IN 25 CITIES ... OFFICES EVERYWHERE

MAZDA LAMPS FOR SEE-ABILITY

icing of equipment purchased by members from commercial dealers may be forced on the distribution cooperatives by insistence of the members, in which circumstance the cooperative feels that it is compelled to compensate itself for such costs by taking on the selling phase of merchandising.

"Before making a decision to engage in merchandising of electrical equipment, the distribution cooperative should weigh all the risks and provide for avoidance of mistakes. The risks are numerous: merchandising calls for special aptitudes and skills (a large proportion of retail enterprises fail); it may lead to violation of state laws or of the cooperative's charter; the non-profit status of the cooperative and its freedom from certain taxes may be adversely affected; ability to liquidate the Government loan may be jeopardized; the good will of established commercial dealers may be lost and public relations impaired; the good will of members may deteriorate if they are restricted in freedom of choice of items; even the control of the cooperative by its own members may be weakened by unwise arrangements with suppliers or financing agencies.

"Before deciding to engage in merchandising of electrical equipment, the distribution cooperative should consider every aspect of the problem and all alternatives under each aspect. The principal aspects of the problem are: (1) the best manner of making equipment available to members, in adequate range, at reasonable prices, and with dependable servicing; (2) provision of capital for setting up the merchandising undertaking; (3) provision of capital for financing consumers' purchases on a partial payment basis; and (4) how adequate servicing is to be provided.

"Before considering any other manner of helping members to obtain equipment, the directors of a distribution cooperative should survey the system area to discover whether local dealers are sufficient in number and carry lines to meet the needs of members, or by collaboration can be stimulated to meet these needs. It should be borne in mind that leading manufacturers have come to recognize the opportunities in rural markets, are designing items of electrical equipment to fit the requirements of rural users, and are carrying out plans to increase the number and improve the quality of their retail outlets as soon as peacetime conditions are restored."

In order to be successful, an appliance dealer in a farm area should be a permanent citizen of his community, and should have the farmers' own interests in mind.

Farm appliances can be classified into two groups, namely, household and productive. Industry should promote the wider use of electricity for productive purposes, but the farmer who uses productive appliances nearly always buys household equipment also. The farmer must be able to know where to see and where to buy the electrical equipment his farm can employ to advantage. In fact, the greatest obstacle to farm sales is the lack of knowledge on the part of the farmer as to where to go for the appliances he needs and wants.

One sure means of overcoming that stumbling block would be for dealers to organize and have equipment on hand locally where it can be seen—actually. The provision of an appealing display center offers one of the best opportunities for promoting large farm sale potentials to any appreciable degree.

The dealer in general merchandising stores at the crossroads knows his people by their first names and, consequently, could become excellent dealer outlets for electrical farm equipment. Moreover, well electrified farms in each county can be used by dealers as important adjuncts to farm selling. The names of such farms can be obtained from county farm agents, or by contacting those farmers personally, or by telephone to learn where the electrical equipment was purchased. One of the most excellent aids to selling would be the employment by the dealers of vocational high school or 4-H Club boys that come into town for employment. Such boys can be developed into efficient service men and, ultimately, into good salesmen, with the distinct advantage of personally knowing the farmers in their areas as well as being acquainted with their electrical equipment needs

Service Important Factor

Adequate servicing should be available to the farmer through the dealer on a 24-hour basis, seven days per week. Moreover, farmers who do their own repair work should have access to a good repair and service man, a stock of wire, and an abundance of electrical supplies. Besides, the dealer ought to be able to give the farmer practical advice regarding his electrical jobs and be able to secure a good wiring contractor whenever the farmer needs one. Incidentally, such wiring contractors can be used as dealer agents and any dealer would do well to promote adequate wiring of farm homes in his vicinity.

Farmers have already been sold on the use of field power equipment, but it's up to the dealer to see that he accepts household equipment with equal enthusiasm. High pressure selling, however, will not 'go over' with the farmer. He prefers to be shown clearly how the equipment works, where he can buy it, and what it would be worth to him. A dealer with plenty of "push" and a knack for selling will be able to carry out a successful selling campaign without 'high pressuring' his customer.

The dealer can demonstrate that productive costs can be cut 25 per cent by the installation of such equipment as water systems, milking machines, milk coolers, dairy water heaters, poultry lighting, and portable motors.

Every productive farm in a district should be analyzed as to its electrification needs and, at the same time, the farmer should be shown the cost of equipment, its cost of operation, amortization, and its depreciation. Against this should be shown the earnings resulting from the use of the electrical equipment. The earnings will offset by far the cost of the equipment.

REA cooperatives as we have seen, do not plan to enter the merchandising business in any community unless dealers fail to provide satisfactory service. Consequently, it is imperative that the dealer be equipped with complete information concerning the use, or probable use, of power on the farms in his area; otherwise, dealers will be unable to serve the farmers adequately and may find himself in competition with the co-op.

Eleven thousand rural women's clubs affiliated with Country Gentlemen entered a kitchen improvement contest. In a booklet entitled "Farm Kitchen Revolt" the best essays and a questionnaire on farm women's desires for specific appliance features are listed. The booklet can be obtained from the Curtis Publishing Company. All will profit from a study of these intelligent farm women's preferences. They want well-made appliances that will save time or perform better.

In the past, the electrical appliance industry has developed three major markets: industrial, commercial, and residential. The fourth great development will be in the farm market which, in the postwar period, is expected to account for 20 per cent of the total sales of appliances and equipment. It is estimated that for wiring appliances and productive equipment there will be a market for four hundred million dollars per year for the first ten years after the war.

Walker "Dualcote" Conduit carries the electric cables in the new Kaiser steel plant

▲ A portion of the Fontana steel plant of Kaiser Company, Inc., now producing much of the steel used in West Coast shipbuilding.

This great plant of Kaiser Company, Inc.—the only completely integrated steel plant on the West Coast—is another of war-time's amazing structural achievements. Within eight months after ground was broken, the blast furnace was in operation . . . to be followed quickly by other production units. Today, pig iron is being poured at a rate of 430,000 net tons annually—steel ingots and high grade alloy steel, 700,000 net tons.

It is significant that in this modern and efficiently equipped plant the numerous electric cables are carried through Walker "Dualcote" Conduit . . . the *twice-protected* conduit that successfully withstands the most severe conditions encountered in a steel plant.

Into both inside and outside walls of Walker "Dualcote" Conduit, is fused a layer of zinc which is so thoroughly distributed that even the threads of the conduit and couplings are fully protected with zinc coating. Being actually alloyed with the steel, it will not crack or flake when bent. And the tiny teeth covering its surface securely grip the outer coating—a new material which strongly resists steam, sulphur and other corrosive chemicals.

Ask your distributor for prices and deliveries. For further particulars, write to WALKER BROS., Conshohocken, Pa.

Many miles of Walker "Dualcote" Conduit are in the power transmission lines.

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GARNETT YOUNG and COMPANY,
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Makers of: Rubber-covered, Synthetic and Leaded Wires and Cables • "Dualcote" Non-metallic Sheathed Cables • Service Entrance Cables • Automotive Wires and Cables • Weatherproof Cables • Lacquer Non-conductive products • Wires and Cables for Instruments • Flexible Metallic Tubing • "Dualcote" Steel Conduit • Conduit Fittings • Inspection Fittings and Systems.

ALL-ELECTRIC KITCHEN —
Spearhead of Appliance Merchandising

APPLIANCE DEALERS who, in pre-war, built their profits on the sale of single appliances will find complete kitchen merchandising a natural step toward better store identification. This will make possible store demonstrations and displays to carry the burden of merchandising, rather than home canvassing or crew selling.

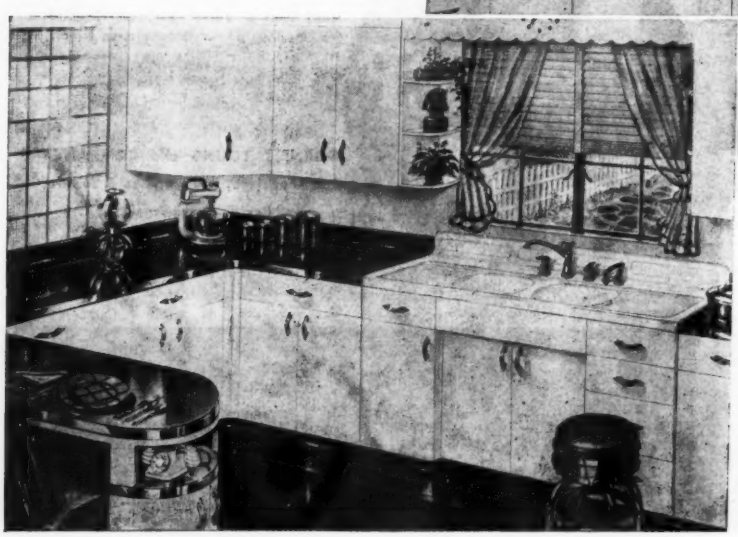
Instead of emphasizing the search for customers, the dealer will stress kitchen planning and cooperation with plumbers, electricians, and building supply concerns. These allied crafts will join in the promotion of kitchen remodeling projects with the aim of selling their services to homes where appliance dealers make sales for complete kitchen ensembles.

Present indications are that almost all large stores in downtown city shopping centers will operate extensive kitchen and home laundry displays. These merchandising operations will be backed by dominant local newspaper advertising to tie-in with natural all-electric kitchen trade and consumer magazine promotions. A result will be that outstanding department and furniture stores will attract thousands of women shoppers to see dramatic electric kitchens in action. Specialized appliance dealers operating in neighborhoods and smaller communities can cash in on this kitchen promotion if they offer plans by which their customers can procure complete kitchen installations.

Women have shown indifference to "artist's dream" wartime designs that show gadgets popping out of walls, glass and plastic mirages have been met with smiles. Mrs. America does not want a revolution in home design, rather, she seeks improvements —changes that are evolutionary. At the moment she is surrounded by considerable confusion as to just what new designs and technical improvements she can expect. She likes the idea of a complete home with matched equipment, whether new, or a remodel of her old home. She has shown a tremendous interest in "complete kitchens," with appliances "engineered" into the room. A result of this interest is that the kitchen has become the focal point of many postwar home plans.

Merchandise "Package" Ensembles

Because all-electric kitchens are recognized as the spearhead of post-war electric appliance merchandising, they should be made available as complete "packages" through appliance dealers. Women should be able to see



The manufacturers are developing the equipment that will enable the dealer to display and sell "package" kitchen ensembles. At left is a model kitchen featuring sink and cabinets manufactured by Youngstown Division of Mullins Mfg. Co. The photograph above shows a model kitchen made up of wall and base cabinets, sink, and appliances manufactured by Crosley.

Industrial Sales and Service are Easier with MITCHELL LIGHTING

HERE'S WHY!

1. MITCHELL fluorescent fixtures assure more abundant, more efficient light for industrial workers.

2. Greater mounting flexibility simplifies installation of single units or continuous rows.

3. Easier, lower-cost maintenance saves time and money.

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Industrial users are quick to discover these benefits. As a result, you have the edge on competition . . . make sales easier . . . build volume business.

Alert Distributors and Contractors in every part of the nation are planning tomorrow's profits . . . *with MITCHELL.*

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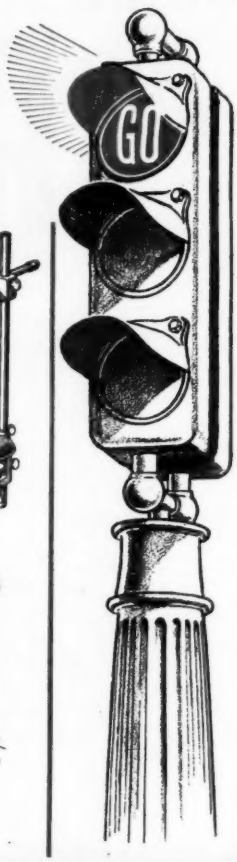

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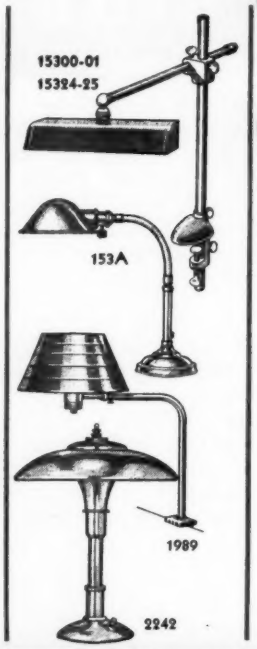
The items shown, as well as many others displayed in the Flyer Catalog, will be available just as soon as raw materials are obtainable . . . some numbers before others. No preference rating of any kind is necessary, altho, under the regulations, rated orders must be shipped first. Get your orders in **now** to be assured of early delivery from our first production run.



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and operate new automatic equipment in store operating displays. Appliance dealers will cooperate with architects and builders to display and demonstrate complete kitchens for home building prospects, and they will have arrangements by which kitchen remodeling can be handled.

While all modern appliances may not be installed at one time in all cases, ultimate complete kitchens will be the aim; and single appliance sales will become part of complete kitchens later. The complete kitchen and home laundry sales approach will become the standard appliance merchandising technique for large stores and specialized dealers.

How To Plan a Kitchen

The procedure for kitchen planning, whether for a new home or for modernization of the old home, should be considered in three phases:

(1) Needs — size of family and amount of entertaining; also the amount of money that can be spent on the kitchen.

(2) Tastes—the kitchen should reflect the owner's personality. Let her taste dictate the colors, curtains and personal touches.

(3) Basic Arrangement — follow these four simple rules established by kitchen experts:

(a) Include counter-tops or working surfaces beside the sink, the range, and the refrigerator.

(b) Place the sink between the range and refrigerator for maximum convenience.

(c) Include a food-mixing center, beside the refrigerator preferably, or beside the range.

(d) Store foods and equipment nearest the place they are used—within arm's reach whenever possible.

A modern kitchen should be planned by "work-centers." Their location and function is to save steps and work by keeping utensils, food and equipment grouped in three main divisions: storage, cooking and dishwashing. The storage and mixing center should be nearest the door through which supplies are brought. The cooking center should be placed near the entrance to the dining room, or eating nook. As with other centers, storage compartments for utensils and supplies should be nearby. The dishwashing center, featuring the electric sink with electric garbage disposall and automatic dishwasher, should be between the other two major centers.

In addition to these three main centers, many kitchens will include "clean-up centers," including a storage place for brooms, mops, and cleaning appliances. Another modern touch

Same tape... same Boy

GIVE an American boy a roll of friction tape and he'll tackle just about any kind of a repair job that comes along... with the odds on his doing it successfully.

When boys like that donned uniform they found their old workbench friend more useful than ever.

Take the men in the Signal Corps, whose resourcefulness in emergencies is legendary. They use a lot of friction tape—from their basic training schools right up to the front line observation posts. And a lot of that tape bears a familiar name—"Holdtite".

Same boy... same tape... made by the same people—United States Rubber Company.

People who buy products create jobs for people who make products. That's how a business grows big. It is your liking for "U.S." products that built this company.

In the field of mechanical rubber goods alone "U. S." products are in use in every phase of the vast, complex war machine... on land, at sea, in the air.

Under the whiplash of military necessity, great scientific strides have been taken in adapting rubber to new purposes. The lessons learned, the skills and techniques perfected will not be lost or forgotten at war's end.

They will be utilized to benefit you... to give you new and better products that bear the "U. S." seal.

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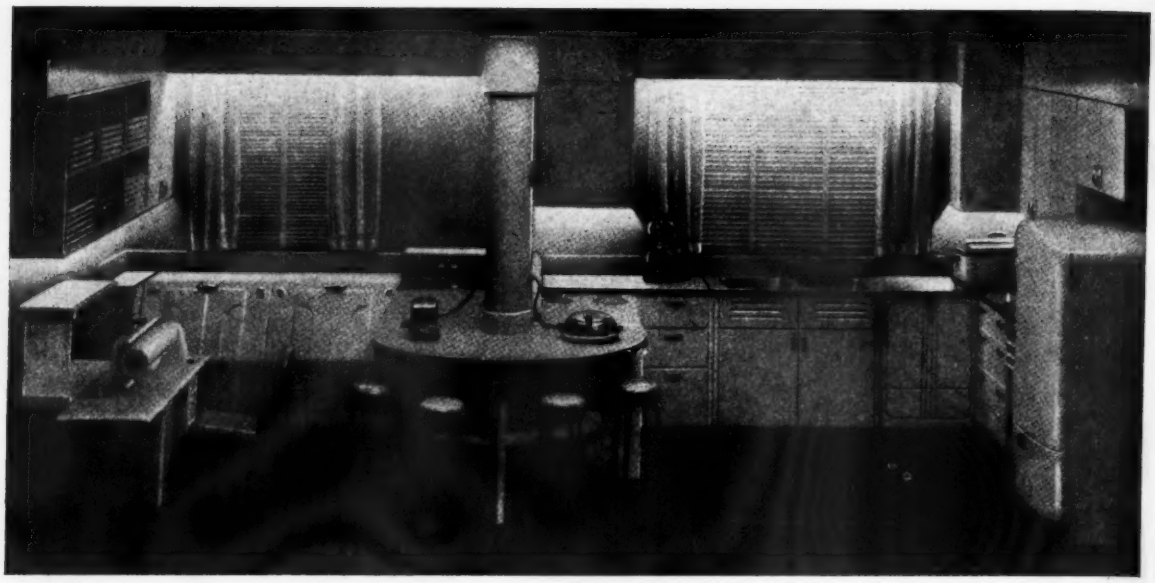


will be a "secretary center," having a desk, files, telephone and other housekeeping conveniences, and, of course, a radio.

Many kitchens will include dining space, although there is a wide difference of opinion on the future of the dining room.

Service rooms adjacent to the kitchen will be popular. Such rooms will include storage space for canned goods, the home freezer, and bins for dried vegetables.

(Above) A combination kitchen, snack bar, and laundry suggested by Westinghouse. (Below) An attractive kitchen and breakfast nook designed by Edison General Electric (Hotpoint) Company.

A word of caution to all who plan to build or remodel in postwar: watch your wiring. *Adequate wiring is most important for good performance of all appliances.* A good procedure is to install three-wire service, whether your immediate plans include an electric range or not. Adequate wiring is easily and cheaply installed at the time of construction; but is troublesome later.

How Kitchens Can Be Financed

Complete kitchen and home laundries can be financed in several manners. The regular dealers, including department and furniture stores will have convenient terms for moderate periods of time ranging up to three

(*Continued on page 102*)

FOR SAFETY'S SAKE . . . USE CONDUIT *(Full Weight Rigid Steel)*

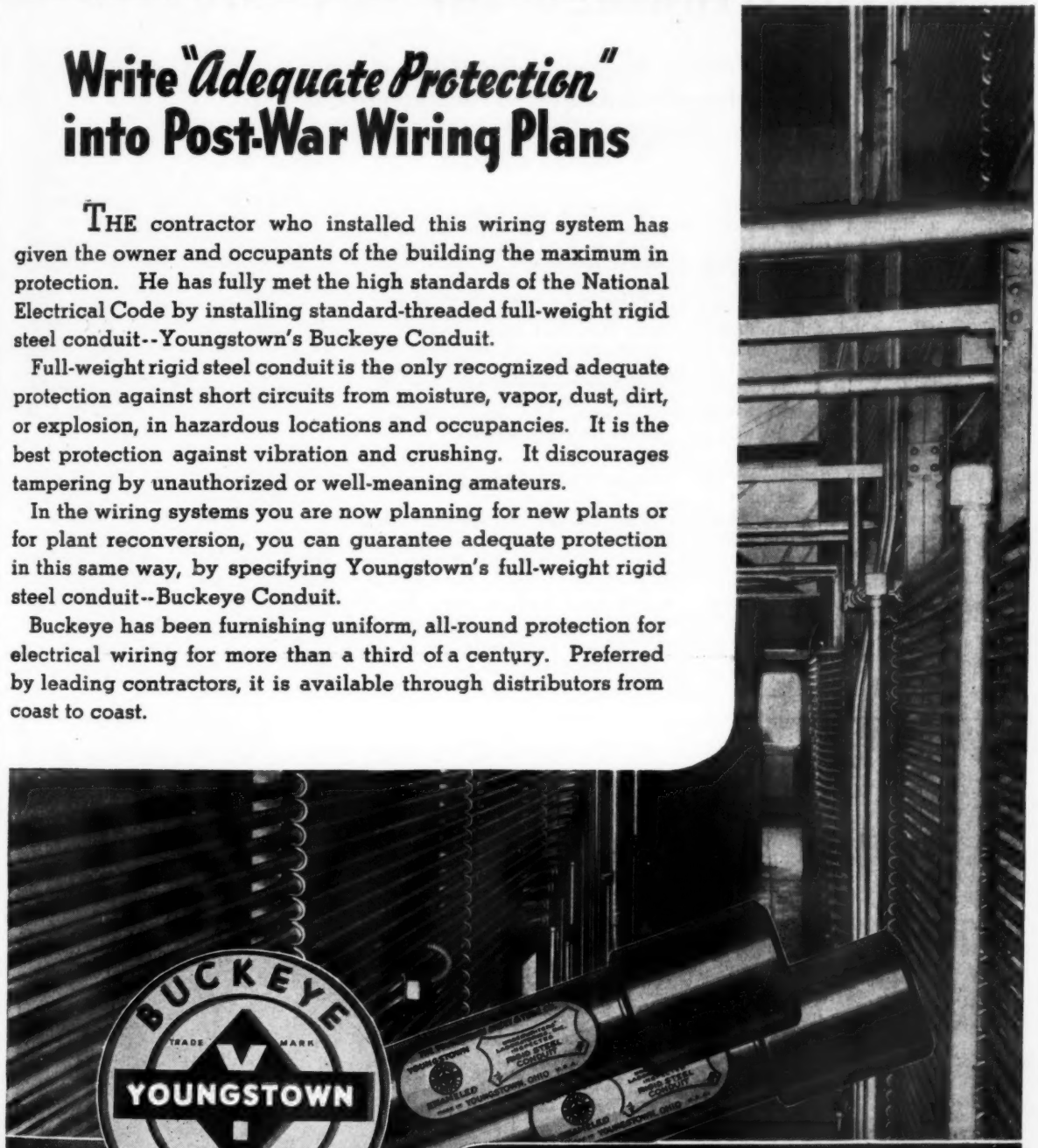
Write "*Adequate Protection*" into Post-War Wiring Plans

THE contractor who installed this wiring system has given the owner and occupants of the building the maximum in protection. He has fully met the high standards of the National Electrical Code by installing standard-threaded full-weight rigid steel conduit--Youngstown's Buckeye Conduit.

Full-weight rigid steel conduit is the only recognized adequate protection against short circuits from moisture, vapor, dust, dirt, or explosion, in hazardous locations and occupancies. It is the best protection against vibration and crushing. It discourages tampering by unauthorized or well-meaning amateurs.

In the wiring systems you are now planning for new plants or for plant reconversion, you can guarantee adequate protection in this same way, by specifying Youngstown's full-weight rigid steel conduit--Buckeye Conduit.

Buckeye has been furnishing uniform, all-round protection for electrical wiring for more than a third of a century. Preferred by leading contractors, it is available through distributors from coast to coast.



Ask your distributor for:
Youngstown Buckeye Conduit-Pipe and Tubular Products - Sheets - Plates - Electrolytic Tin Plate-Coke Tin Plate-Bars-Rods-Wire-Nails-Tie Plates and Spikes.

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Wave Windings for A-C Motors

Chapter 4—Step-by-step design of a complete wiring diagram of conventional type.

By A. C. Roe*

This is a continuation of the series of articles, which started in the June 1945 issue of Electrical South, covering a complete study of a-c wave windings. This series will include a complete set of connecting diagrams developed on a new, simplified basis which eliminates the use of the large detailed drawings heretofore associated with wave windings. New subscribers can obtain copies of the first articles by writing to the editor of this publication.

THIS chapter will demonstrate the use of the terms described in the preceding chapters by designing, step-by-step, a standard type, complete winding diagram for a four-pole, three-phase, 12-slot, 1-slot-per-pole-per-phase winding. The winding will be designed to utilize left-hand coils, with leads on bottom, and with numbering and phase rotation both counterclockwise.

The first step, as shown in Fig. 10, is to arrange 12 slots equally spaced, 30 degrees apart, each slot having one solid line and one dotted line as shown. For left-hand windings, the full line should be on the right, as shown in Fig. 10. (For right-hand windings, put the full line on the left.) Top coil halves and leads are indicated by the dotted lines.

Next, number the slots counterclockwise since this winding is to be left hand, leads on bottom. (The numbering of the slots would be counterclockwise also for right hand, leads on top. However, the numbering would be clockwise for windings that are right hand, leads on bottom, or left hand, leads on top.) Fig. 10 shows the numbering of the slots with number one slot on the top vertical center line.

Mark the slots off into phase groups, as A, B, C, in the same direction of rotation as the slot numbering. There must be as many slots of the same phase adjacent as there are slots per-pole-per-phase. Since the winding under discussion has only 1 slot-per-pole-per-phase, the phase designation of the slots is A, B, C, A, B, C, A, B, etc., as shown in Fig. 10. (If the winding was being designed for 2 slots-per-pole-per-phase, the phase designation of the slots would be A, A, B, B, C, C, A, A, B, B, etc.)

The slots are then arranged into pole groups, in this case for four poles starting on slot number 1 and proceeding counterclockwise, with three slots per pole. (The slots-per-pole is always equal to the number of phases times the number of slots-per-pole-per phase.)

Placing Direction Arrows

As in all developed windings, the arrows indicating instantaneous direc-

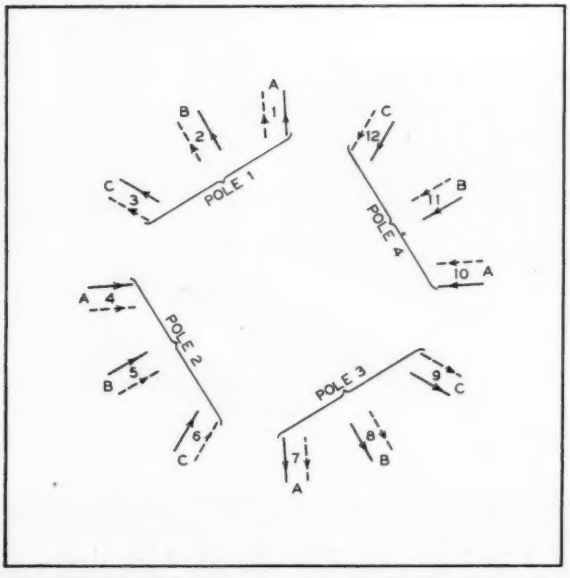


Fig. 10. First step in laying out a conventional wiring diagram for an a-c wave winding. Succeeding steps are shown in following figures. The diagram is for a 4-pole, 3-phase motor having 12 slots and 1 slot-per-pole-per-phase. Slots are shown here arranged in pole groupings with arrows to indicate instantaneous polarity. Both slot numbering and phase lettering are in counterclockwise direction.

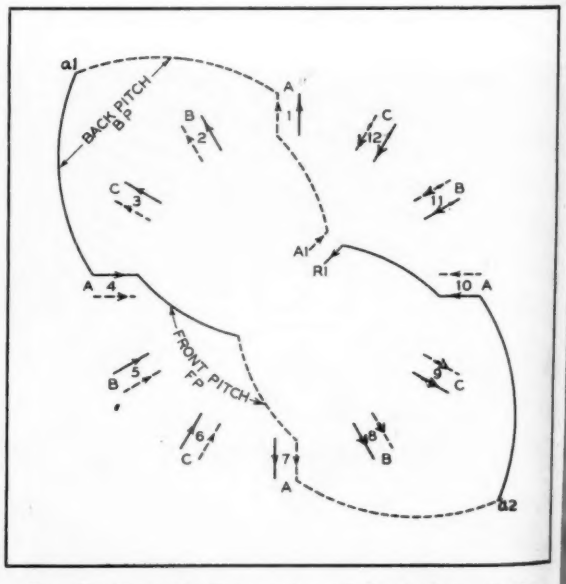
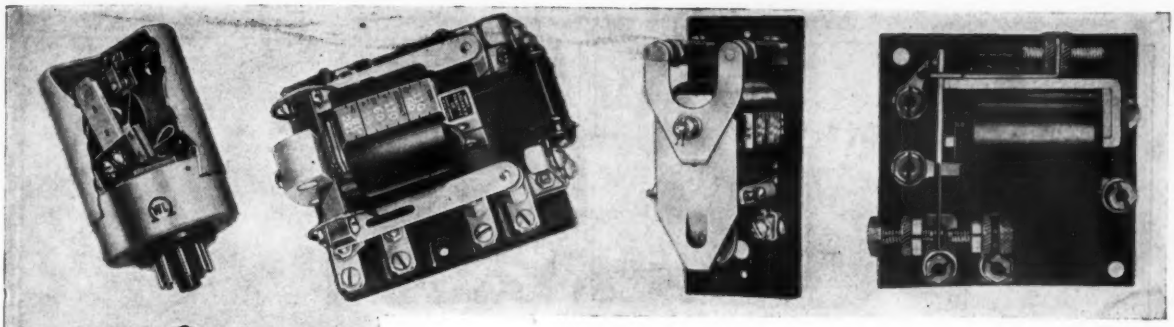


Fig. 11. Here the first section of the A-phase winding has been drawn in. It includes two coils, designated as "a1" and "a2". Both the back pitch and the front pitch are 1 and 4. This winding will have two conductors per slot. The dotted lines indicate a conductor in the bottom of a slot while the solid line indicates a conductor in top of slot, that is, nearest to the air gap.



RELAYS

FOR POSTWAR JOBS

It is an interesting commendation that many of the regular line of Ward Leonard Relays have so effectively served the needs of our Army, Navy and Air Corps. This is a tribute to the design and quality of Ward Leonard routine production.

Designers of postwar products may rest assured that when they select relays from the Ward Leonard line, they have chosen relays of proven merit. The line includes types and capacities for practically every commercial, industrial and communications application.

Bulletins available describing light, intermediate and heavy-duty relays in various contact combinations. Send for bulletins of interest to you.

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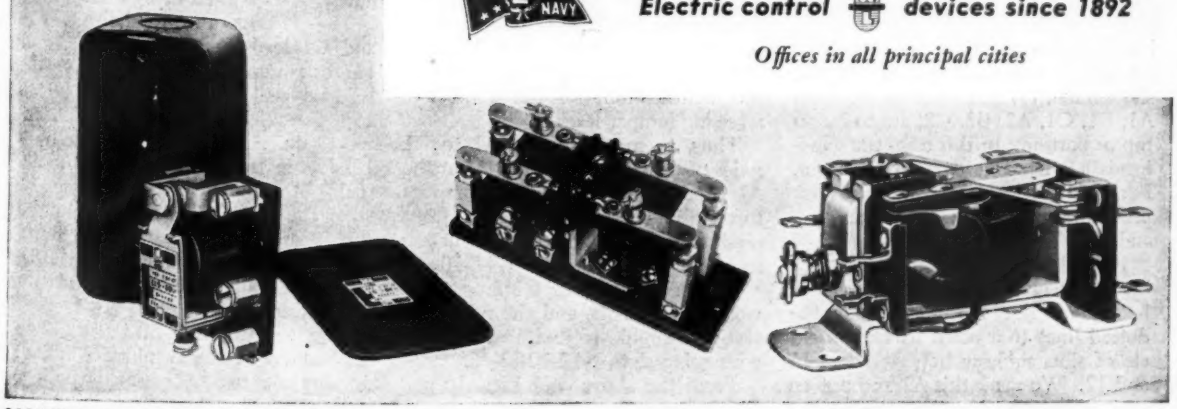

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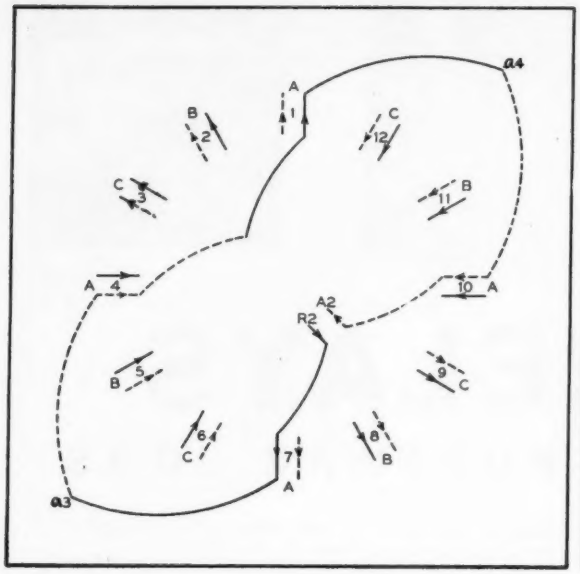

Fig. 12. The second section of the A-phase winding is shown here with the coils designated as "a3" and "a4".

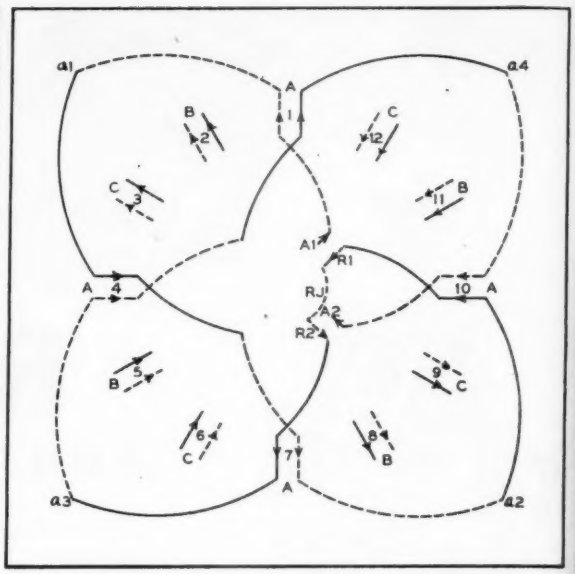

Fig. 13. The two sections are superimposed to show the complete A-phase winding. Note placement of leads.

tion of current flow under one pole should all point in the same direction, and the arrows of adjacent pole slots should point in the opposite direction. In this series, the number one slot is used for the A1 lead, and this lead is used as the ingoing or entering lead of the winding. Therefore, the arrows in slot 1 point away from the center, as in Fig. 10, and the arrows of all slots on pole 1 point in this same direction. The other pole slots are then marked, as shown in Fig. 10, the arrows pointing in alternate directions as we progress from one pole to the next.

The explanatory diagrams are constructed by adding one section of one phase at a time, starting with the A-phase A1 to R1 section, then the R2 to A2 section, next the B phase B1 to B3 section, and so on.

In order to start the winding design, it is necessary to know (1) the hand of the winding, (2) the back pitch, (3) the front pitch, (4) the short pitch, (5) and whether the leads A1, B1, C1, A2, B2, C2, are to be on top or bottom. In this case, the winding is left hand, leads are on bottom. For 1 slot-per-pole-per-phase, the back pitch and front pitch are 3 slots, or 1 and 4.

Fig. 11 shows the winding started by filling in a dotted line from the bottom of slot 1 (indicated by the dotted line) to a point inside the circle of slots midway between slots 11 and 12. We mark this A1 and put on an "in pointing" arrow. Across the rear of the winding (that is outside the circle of slots), the solid line of slot 4 is joined to the dotted line of slot 1, with dotted lines for the bottom half and solid lines for the top half as shown in Fig. 11. Note the continuity of the direction arrows in slots 1 and 4, as we trace through the coil beginning at A1. The solid line is extended from slot 4 to a point inside the circle of slots halfway between slots 5 and 6. This completes the **a1** coil.

To continue the series of two coils, for the four-pole winding, use a front pitch of 1 and 4 and connect the solid line from slot 4 by means of a dotted line to the dotted line of slot 7. To form the **a2**, or second coil of the series, use the back pitch of 1 and 4 to join slots 7 and 10. As before, the full and dotted lines are used to indicate top and bottom coil halves.

The series of coils is ended by extending the top lead of coil **a2** from slot 10 out adjacent to the A1 lead. This last lead is marked R1, which is the identification for the number 1 reversing jumper lead.

Thus, to form the first A1 to R1 series of coils, the coil is started at the A1 lead, in slot 1. It progresses through a back pitch, then a front pitch, then a back pitch and half the front pitch, joining slots 1-4-7-10.

For a six-pole, 1SPP winding, there would be 18 slots, and the A1 to R1 section would pass through three coils using slots 1-4-7-10-13-16.

From the above, and Figs. 10 and 11, it is possible to state a rule for locating the R1, R3 and R5 leads when the slot number of the A1, B1 and C1 leads are known. Add to the slot number of the A1, B1, or C1 leads, the number obtained by subtracting one from the number of poles and multiplying this by the back pitch. For example, in the case of a four-pole winding with back pitch of 3, the number is (4-1) x 3 = 9. Since the A1 lead is in slot 1, the R1 lead will be in slot 10. Similarly, with B1 and C1 leads in slots 5 and 9, respectively, the R3 and R5 leads will be in slots 5 + 9 = 14, and 9 + 9 = 18, respectively. Since there are only 12 slots in the motor under discussion, we obtain the proper slot number by subtracting 12. The actual slot numbers for the R3 and R5 leads, therefore, would be 14 − 12 = 2 and 18 − 12 = 6, respectively. For a six-pole motor having 1SPP (and therefore having a back pitch of 3) the number is (6 − 1) x 3 = 15. If the A1, B1, and C1 leads are in slots 1, 7, and 13, for example, then the R1, R3, and R5 leads will be in slots 15 + 1 = 16, 15 + 7 = 22, and 15 + 13 = 28, respectively. Again, since there are only 18 slots in this motor, we get the actual slot number by subtracting 18 when the slot number obtained by the rule is larger than 18. The slot numbers of the R1, R3, and R5 leads, therefore, would be 16, 4 and 10, respectively.

The next step is to fill in the R2 to A2 section of the A phase winding. In any a-c two-layer wave winding, each phase of a three-phase grouping will use one-third of the slots, and

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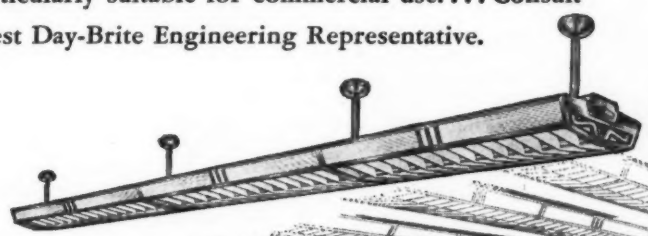

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each slot will contain a half coil of each section. Thus, in Fig. 11, the first A section used up half of slots 1, 44, 7, 10; the second A section must use up the space left in slots 1, 4, 7, 10; the second A section start on an R2 lead, and this lead will correspond with the R1 lead as to whether it is a top or bottom lead. In this case the R2 lead will be on top since the R1 lead was a top lead. (The same rule holds, of course, for the R4 and R6 leads of the B and C phases.)

The next problem is to determine what slot the second A-phase section will start in. The rule for locating the slot of the R2 lead is as follows: Locate the R2 lead in a slot one back pitch in a **minus direction** from the R1 lead slot. In Fig. 11, the R1 lead was on the top of slot 10. Since the back pitch is 3, we have (10-3) = 7, and the R2 lead should be on the top of slot 7. As shown in Fig. 12, the arrow in this slot should be in a direction to insure continuity of the first and second series when R1 is connected to R2. (The same rule can be used for locating the proper slot for the R4 and R6 leads. The R4 lead slot is one back pitch in a minus direction from the R3 lead slot; and the R6 lead slot is one back pitch in a minus direction from the R5 lead slot.)

Reversing Jumpers

The method of locating the R2, R4, and R6 leads in a *minus numbering direction* from the R1, R3, and R5 leads indicates why these connections are called reversing jumpers. As shown in Fig. 13, the R1 and R2 leads when joined together reverse the direction of pickup of coils **a3** and **a4**. They are picked up in a direction opposite of that followed through coils **a1** and **a2**.

The second section of the A-phase winding is started in Fig. 12 with the R2 lead in the top of slot 7. Coil **a3** is formed with a back pitch of 3 from the top of slot 7 to the bottom of slot 4 across the rear. Coils **a3** and **a4** are joined with a front pitch of 3 from the bottom of slot 4 to the top of slot 1. Coil **a4** is formed by joining the top of slot 1 across the rear to the bottom of slot 10, and the A2 lead is brought out on the bottom of slot 10.

In Fig. 13, the complete A-phase winding has been drawn in. Starting at the A1 lead, the winding can be traced through coil **a1** and **a2** in a counterclockwise direction. The reversing jumper then connects the R1 lead to the second A-phase section beginning at the R2 lead. The winding then continues through coils **a3** and **a4** in a clockwise, or reversed direction, and ends on the A2 lead.

"This is Mr. Cornish, who takes care of all of our short circuits!"

A study of Figs. 10, 11, 12, and 13 will reveal certain basic principles of the a-c wave winding when it has a whole number of slots-per-pole-per-phase, such as 1, 2, 3, etc.

First, note the close grouping of the A1, R1, A2, and R2 leads on the inner circle. On a connected winding all four of these leads would be close together.

Second, note that the R1 and A2 leads are in the same slot, and that this slot is one back pitch from both the A1 and R2 lead slots. The R1 and A2 leads will always be grouped together like this, not necessarily in the same slot, but at each end of the group of slots equal to the number of slots-per-pole-per-phase. (See Figs. 3 and 4 of the first article.)

A third rule can be obtained from Fig. 13. That is, the A2 lead will always be in a slot equal to one back pitch in a minus direction from slot number 1 or the A1 lead slot. In Fig. 13, slot 1 is also slot 13, then 13 minus 3 puts the A2 lead in the bottom of slot 10.

From the foregoing it is apparent that once we locate the A1, B1 and C1 lead slots, the other lead slots follow a definite mathematical rule. A study of any type or make of true a-c wave winding diagram will bring out this fact.

In Figs. 11, 12, and 13, note how the two sections of a phase use up the top and bottom coil halves in each slot. Thus, with a whole number of slots-per-pole-per-phase, such as 1, 2, 3, etc., the A, B, and C phase coils are separated, and this type of winding is free from overlapping phase belts.

Full or 100 per cent coil pitch is another feature of the whole number slot-per-pole-per-phase true a-c wave windings, as shown in Figs. 11, 12, and 13, where the back and front pitch, expressed in slots, always equals three times the number of slots-per-pole-per-phase. Note that the number of poles does not enter into this calculation except that the total number of slots in the winding must equal number of poles, times number of phases, times number of slots-per pole-per-phase.

This statement can be checked with Table No. 1 of Chapter III. A four-pole, 48-slot, 3-phase winding has four slots-per-pole-per-phase and a back or front pitch of 12, or 1 and 13. If the number of slots, 48, is divided by the number of poles, 4, the result is 12. Thus, dividing the number of slots by the number of poles indicates that the pitch is the number of slots per pole. It is obvious from this that the pitch is three times the number of slots-per-pole-per-phase.

For counterclockwise windings left hand, leads on bottom, and right hand, leads on top, the grouping of all the leads of any one phase will be in the same order shown in Fig. 13, that is, as A1, R1, A2, R2; B1, R3, B2, R4; and C1, R5, C2, R6. For clockwise windings, left hand, leads on top, and right hand, leads on bot-

(*Continued on page 102*)

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Like prehistoric monsters emerging from the sea, the famous "water buffalos" spearhead the assaults on Jap-held Pacific Islands, carrying the first attack wave up the beach and into land combat.

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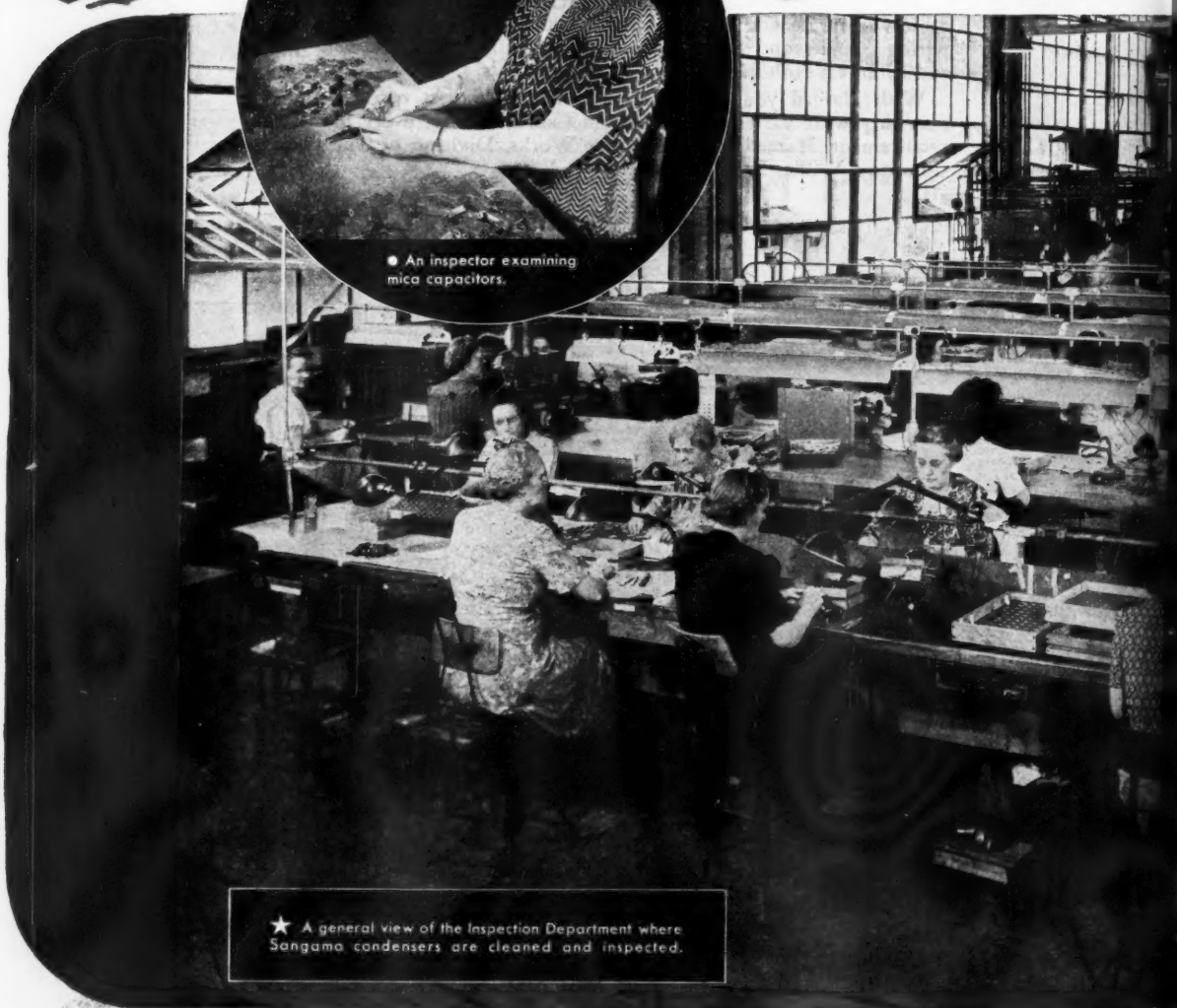

★ A general view of the Inspection Department where Sangamo condensers are cleaned and inspected.

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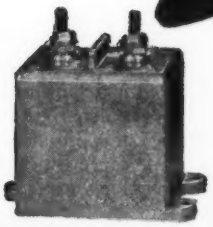

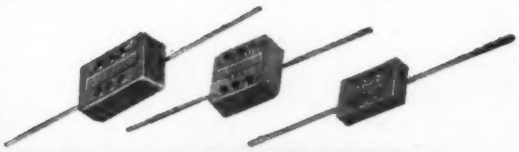

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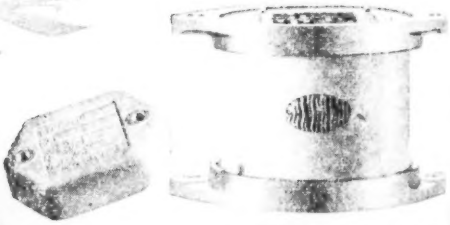

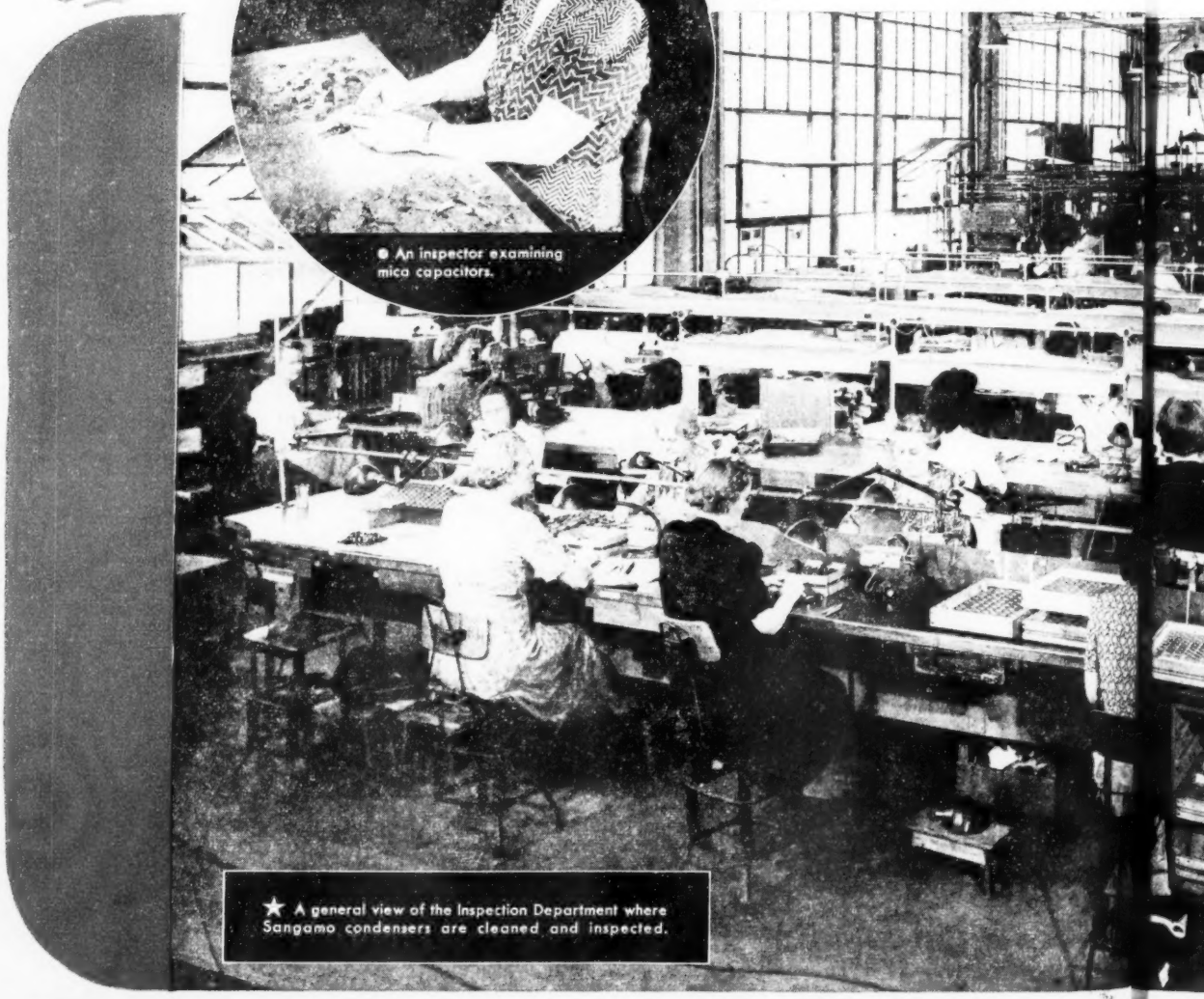

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Another finishing operation is inspection and the cleaning of the terminals, so that proper contact is insured when the capacitor is installed.

Capacitors are also inspected for physical imperfections, such as cracks, chips, and foreign inclusions in the bakelite, as well as for mechanical dimensions. It is essential that each capacitor passed must be within the right physical tolerances in order to insure that it will fit properly in its designated space in the customer's equipment.

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NEWS of the INDUSTRY
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UTILITY COMPANIES FORM NATIONAL ASSOCIATION

Formation of an industry-wide association of electric light and power companies, with headquarters to be established in Washington, D. C., about August 1, was announced July 16th by its organizing committee consisting of A. C. Spurr, Fairmount, W. Va.; James M. Barry, Birmingham, Ala., and K. M. Robinson, Spokane, Wash., all operating electric company officials. Beginning with a representation of 13 million distributing meters, or about one-half of the industry, the association will be modeled functionally along the lines of the Association of American Railroads.

The purposes of the new association, it was stated, will be to further the interests of the customers, employees and investors of the member companies; to coordinate regional activities among them to maintain the integrity and credit of the industry; to further cooperation between governmental departments and agencies dealing with them and with the supply of electric light and power; to present the facts concerning public benefits resulting from the operation of taxpaying electric utility companies by business men under governmental regulation as distinguished from government ownership and operation.

In furtherance of these objectives it is the purpose of the new organization to conduct a broad program designed to demonstrate the important contribution of this industry toward a sustained and balanced national economy and to continued large employment.

Tentatively named The National Association of Electric Companies, its president will be Purcell L. Smith, of Chicago. He will resign as president of the Middle West Corporation, which office he has held for over seven years. Mr. Smith was asked to take the presidency of the association because of his accomplishments and long experience in the operation of electric light and power companies.

This photograph shows several men from Frigidaire Division, General Motors Corporation, Dayton, Ohio, admiring the first household refrigerator manufactured by Frigidaire since April 30, 1942. At left of refrigerator, from left to right are, E. R. Godfrey, general manager; C. W. McMullen, manager Standards Division, and R. V. Polen, assistant works manager. At right of refrigerator, left to right, first row, are S. M. Schweller, chief engineer; H. M. Kelley, appliance sales manager, and P. M. Bratten, general sales manager. Second row are J. W. Krueger, general superintendent of plant No. 2, and H. F. Lehman, assistant general sales manager.

MILLION FREEZER UNITS PREDICTED NEXT YEAR

Demand for approximately 1,000,000 home and farm freezer units in the next year was predicted recently by the Refrigeration Equipment Manufacturers' Association, Chicago, Ill. The estimate was based on a compilation of facts gathered through consumer surveys and reports issued by government agencies, university extension departments, farm and trade publications and farm organizations.

A large percentage of this first million freezers probably will go into farm homes, according to F. J. Hood, president of the association, who pointed out that it was the nation's farmers who pioneered the use of home freezing units and that these same farmers now have total reserves, available for buying consumer products, of more than 12 billion dollars. Total farm income in 1944 alone reached the huge total of nearly 28 billion dollars.

In addition, Mr. Hood said, electrified farms are expected to increase at least 50 per cent as a result of programs of the Rural Electrification Administration and public utilities. Some 2,600,000 farm families now receive central station electric service, he added.

But growing popularity of the home freezing method of preserving foods is by no means confined to farm families, the REMA statement continued. In cities and urban communities, this method has shown a definite upward trend since the start of the war, partly as a result of the activities of Victory gardeners. While it is recognized that much war-induced home gardening now will cease, REMA believes that the present rate of increase in the number of families attracted to

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home freezing and frozen food advantages, now estimated by the Department of Agriculture at 1,000,000 a year, will be maintained.

Further substantiating this opinion is the fact that commercial food packers envision a soaring in sales of frozen foods to 3,500,000,000 pounds annually with 2,000 companies processing and packing such foods by means of mechanical refrigeration.

HOTPOINT APPLIANCE PRODUCTION STARTS

Production of electric appliances for civilians started August 28 at Edison General Electric (Hotpoint) Appliance Company's Chicago plants, with the first electric water heaters since 1942 coming off the assembly lines. Electric ranges will follow about Sept. 1, and other appliances later in the month, according to Ward R. Schafer, vice-president.

He said that the company's manufactured products, including electric refrigerators, automatic electric dishwashers, garbage disposals, washing machines, electric ironers, electric tumbler dryers, and metal wall- and base-cabinets, would not differ greatly in design from those produced for 1942 sales; but that previously announced automatic washer and home freezer would not get into immediate production.

The company's electric dishwasher was changed radically in 1942 to affect automatic, soapless operation, making that machine "revolutionary to 99 per cent of the homes."

Electric ranges will be produced in limited quantities during the fourth quarter of 1945, but greatly accelerated output during 1946 will exceed any production rate in the forty years since the first commercially successful electric range was made at the company's Chicago plant in 1910, Mr. Schafer said, adding,

"Our first electric water heater output is being shipped to the Hawaiian Islands for emergency Navy housing, so it will be several days before heaters for our dealers will be produced. As with other appliances, the production rates will be slow at first and we can only promise a trickle of appliances immediately." The water heater line will include sizes from 10 to 86 gallons, with round and table top models, but the first production will be confined to 30-gallon heaters. The Hotpoint company's refrigeration production is underway now, but early output is being shipped to government stock-pile. As with other appliances, models will be available for dealers in early 1946. The home freezer will make its appearance even later, due to manufacturing lags with a new product, it was pointed out.

Home laundry equipment will be produced in the company's factories during September, with production of automatic washing machines delayed until other lines are underway. The first washing machines will be standard eight-pound capacity with wringer. Electric ironers will be produced in two models, portable rotary with 22" roller, and a flat-plate table-top model.

The production line for dishwashers will be functioning by the latter part of September, with quantities being limited until late in the year; after which output rate will exceed that of any of the previous twenty years that the company has made this appliance. Metal wall- and base-cabinets will be in limited production after the middle of the month. Production of the garbage disposal is planned for early resumption, Mr. Schafer concluded.

SALES TRAINING PROGRAM ANNOUNCED

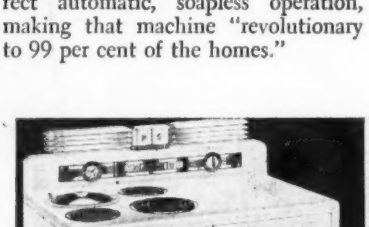
The Edison Electric Institute announces that its eagerly awaited sales training program for the electrical industry is now in a production stage. The complete course consists of 18 sound-slide films and records; an equal number of silent trailer-films; 18 salesmen's manuals ,and the same number of leaders' guides. It is designed to embrace all branches of the industry with regard to the sale of service by electrical manufacturers, wholesalers, and dealers.

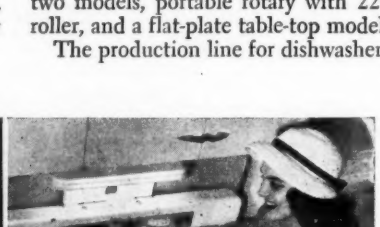
In its entirety, the program contemplates the training in 18 meetings or lessons, of salesmen engaged in residential, commercial, industrial, and rural branches of selling. The first eight of these meetings apply to all groups and consist of the fundamental principles of selling, regardless of the particular product or service. This group starts at bed-rock and trains the salesman in the causes and effects of selling, the arrangement of sales arguments in logical pattern, the most economical use of his time and the customer's view point with respect to sale.

On this foundation, the balance of the lessons go on to develop the application of these basic principles to specific product or service sales. In the residential field the course provides for four lessons in the sale of appliances and develops the application of the fundamentals to the sale of electric ranges, water heaters, refrigerators, and the home laundry. In the commercial sales field there are again four lessons covering store lighting, school and office lighting, commercial cooking, and miscellaneous motor applications.

The sales training course for industrial representatives who have completed the eight basic training lessons will consist of a leader's manual which correlates the eight basic courses with the existing power sales manual. The latter manual, developed by the Industrial Power Committee of the Edison Electric Institute, is recognized by power engineers as a fundamental textbook.

The course for rural men will con





(Left) The Hotpoint Masterpiece, RC8 range, has fully automatic oven clock control and timer, control temperature, Calrod heating units and Calrod cooker unit under a giant Thrift cooker, illuminated switch dials, warming compartment, oven racks for roasts, condiment set, and twin Venetian lights. This range is 39 inches wide and 25 inches deep. The first postwar Hotpoint line will include two other models: the Hostess, a moderate price range, and the Century in the lowest price class. (Right) A day of freedom for this modern matron follows setting the time on the new Hotpoint RB-17 automatic electric range. Her entire evening meal is in the oven ready to cook when the heat snaps on later in the day; when it is cooked, the heat will go off and the meal will be ready for serving when she and her family arrive home this evening.

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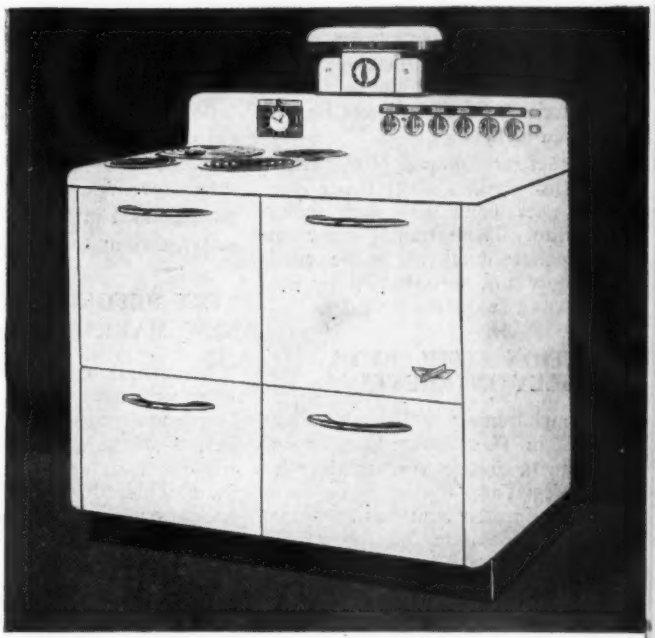
Tel-a-cook Lights

Another swell G-E exclusive! A distinctive color flashes on the control panel for each cooking speed . . . tells at a glance what's going on the range, where and at what speed!



• **G-E Stratoliner**—the last word in a modern electric range. Also in the line will be the G-E Airliner and G-E Leader, styled for beauty and top performance!

• • •

We're telling women all about G-E Ranges, with radio and magazine advertising. And there's already a huge market "sold" on G. E.! In fact . . .

A recent survey showed that among both men and women who intend to buy an electric range, G. E. received 56% of the votes, more than all other electric range makes combined!

G. E. has been "on the nose" with competition in each price class—and yet, because of carefully selected features to help step up the sale, *General Electric produced the highest average unit range sale in the industry!*

Before the war, G-E retailers consistently produced *more dollars* per sale on ranges . . . and that will continue!

FOR GOOD LISTENING: *Don't miss Art Linkletter, in "The G-E House Party," every afternoon, Monday through Friday, 4 p. m., E. W. T., CBS. "The G-E All-Girl Orchestra," Sunday, 10 p. m., E. W. T., NBC. "The World Today," News, Monday through Friday, 6:45 p. m., E. W. T., CBS.*

FOR FINAL VICTORY—BUY AND HOLD MORE WAR BONDS

AUTOMATIC ELECTRIC **RANGES** | "THE APPLIANCES MOST WANTED BY MOST WOMEN" GENERAL ELECTRIC

sist of two lessons applying the basic principles to the rural field and describing the applications of electricity on the farm.

It is anticipated that this sales training program will be completed the latter part of the year.

The material for each training meeting will include first a sound slide film that dramatizes the sales training, pictures right and wrong approaches, and compares successful and unsuccessful methods visually. Using the same technique applied so successfully in the production of training films for the Army and Navy, these dramatic presentations make learning quicker and easier for the new man and serve as a refresher course for ex perienced men.

Another valuable part of this training technique is a silent trailer film which goes along with each sound slide film. These trailers point up the situations developed by the sound slide story and are intended for discussion and analysis.

AVIATION CORP. BUYS CROSLEY INTERESTS

Formal transfer of the controlling interest in The Crosley Corporation, Cincinnati, to The Aviation Corporation, New York City, by Powel Crosley, Jr., founder and head of The Crosley Corporation since its organization, has been made.

Transfer of the controlling interest in Crosley occurred when Irving B. Babcock, president of The Aviation Corporation and newly-elected president of The Crosley Corporation, tendered to Powel Crosley, Jr., checks for $12,117,339 in payment for the common stock of The Crosley Corporation which had been held by Mr. Crosley and members of his family.

With Mr. Babcock and Mr. Crosley at the formal transfer of control were R. C. Cosgrove, vice-president and director of The Crosley Corporation and general manager of the manufacturing division; and James D. Shouse, vice-president and director of The Crosley Corporation, and general manager of the broadcasting division.

Both Mr. Cosgrove and Mr. Shouse will continue as directors and in their present positions as managing heads of their respective divisions. Policies will be continued in the future as in the past, according to Mr. Babcock.

"TRY BEFORE YOU BUY" NEW MARKETING PRACTICE

Merchandising of semi-portable room air conditioners, on the familiar "try before you buy" plan utilized by dealers in many smaller appliances, will be tried in the postwar period, H. F. Hildreth, manager of the Refrigeration Specialties Department, Electric Appliance Division of the Westinghouse Electric Corporation announced recently.

"The moment wartime restrictions relax to the point of permitting us to start the manufacture of Mobilaire room air conditioners, our dealers expect to start putting them into commercial establishments and homes for a small installation fee," Mr. Hildreth continued. "If the prospect decides to buy the unit, the installation fee is applied to the cost. If he should decide that he doesn't want the unit after all, the installation fee will help defray the cost of the trial installation."

The Mobilaire is a room air conditioning unit, which not only reduces room temperature, but also circulates air, brings in fresh air from outdoors, exhausts stale air from rooms, removes dust and dirt from the air, reduces humidity and shuts out street noise and dirt.

"It has been estimated that the demand for room air conditioners will be at least 100,000 units during the first year that unrestricted manufacture is permitted," Mr. Hildreth said, adding, "this figure takes in both new installations and the replacement of worn out or obsolete equipment."

A survey conducted by Westinghouse has shown that, of the 1941 Mobilaires sold by the company, 45 per cent went into private homes and apartment houses, indicating that the residential market offers the greatest

This Emblem Stands For Honorable Service To Our Country

Fortunately, relatively few of our men who have returned to civilian clothes after their job overseas bear visible evidence of the job they did and the hardships they withstood. We are thankful that most of them need to wear an emblem so that we may recognize them for the service they rendered.

The honorable discharge emblem should bring pride to our hearts wherever we see it—pride for the job they did and pride because they are home again. We should recognize it and honor it. No back slapping, the men don't want it—but they do want all to know that they are honorably discharged.

When Irving B. Babcock, president of The Aviation Corporation, handed half a dozen pink checks to Powel Crosley, Jr., founder and long-time president of The Crosley Corporation, Cincinnati, control of the Crosley organization was transferred to Avco. The checks totalled over $12,000,000. At the ceremony were, left to right above: J. D. Shouse, vice-president and general manager, Crosley broadcasting division; Babcock, Crosley, and R. C. Cosgrove, vice-president and general manager, Crosley manufacturing division. Avco's total commitments in the Crosley deal are over $21,000,000.

...Alcoa A.C.S.R. Conductors

Standard span of 300 feet or a long span of 950 or more—engineer and erect your power line according to Alcoa standards and you'll have a line to be proud of. It will be dependable and easy on your pocketbook throughout the years.

Alcoa standards of construction include fittings designed especially for use with A.C.S.R.; armor rods, for example, protect cables at supports. Long spans and flat sags are permissible when A.C.S.R. standards are followed.

Men with years of operating experience report, "A.C.S.R. power lines cost less to build. And they cost less to operate." ALUMINUM COMPANY OF AMERICA, 2164 Gulf Building, Pittsburgh 19, Pennsylvania.

ALCOA A-C-S-R

single sale for room air conditioners. Twenty per cent were purchased by the commercial market, small shops, private offices, banks, schools and hospitals, while another 15 per cent went into professional offices. The remaining 20 per cent were sold to the industrial market for use in private offices and small laboratories.

"In checking these markets we find that, all are within easy reach of the appliance dealer's place of business," Mr. Hildreth continued, "and so the Mobilaire will be sold through our normal distributor-dealer channels in the postwar era. These are the same outlets that sell the company's full line of appliances. The unit will also be sold through department stores and specialty dealers."

THREE NEW PRODUCTS REVEALED BY NORGE

Details of three new products, one of which the company is acclaiming as a "first," were revealed in Detroit recently by M. G. O'Harra, vice-president and general sales manager of the Norge division of Borg-Warner Corp. The three are a portable water cooler, a home and farm freezer, and an automatic cycle washer.

Constituting additions to the company's line of household appliances which includes refrigerators, gas and electric ranges, standard washing machines and home heaters, these new products will be marketed through the companys' dealers as soon as manufacturing conditions are such as to permit mass-production, O'Harra said.

Salient features of the three are as follows:

Portable water cooler. First small, easily transportable water cooler ever to be offered. Adaptable for use in offices, homes, hospitals, hotels, clubs and elsewhere. Capacity of 1½ gallons, which can be cooled in one hour. Powered with 1/12 hp. hermetically sealed "rollator" unit.

Home and farm freezer. To be offered initially in four sizes, three primarily for the city or suburban home, and the fourth for the farm. Capacities to be 6 cubic feet, 11, 18½ and 26. Chest-type, lift lid construction. Modernly styled with white exteriors to blend with other appliances.

Automatic cycle washer. Design and features are such as to lead company officials into the belief it is likely to open up an entirely new segment of the field for this type product. Fully automatic in operation. Exterior dimensions standard. Other details withheld.

The cooler is approximately 22 inches wide, 13 high, and 12 deep. It can be carried easily by the average individual. The water compartment is styled to hold a one-gallon bottle, or can be filled from a pitcher. With full one-gallon water bottles weighing only 9 pounds, they can be handled easily by the average housewife or office worker, O'Harra pointed out. However, the cooler is so designed that five-gallon bottles may be used if this is desirable. A cup dispenser is attached to the front of the cabinet.

The freezers are to be offered in a variety of sizes "in order to meet the specific needs of the consumer," O'Harra explained. "Some," he said, "will want the six-cubic-foot, single compartment unit for the city and suburban home." This freezer is intended, fundamentally, for storage but will freeze foods satisfactorily. A 1/6 hp. hermetic motor-compressor unit will provide power.

Those who intend to process foods from their own garden probably will be interested in the next largest, or 11-foot cabinet, O'Harra stated. This model, powered by a ¼ hp. motor-compressor, has a large storage space with a separate freezing section, while compartments have individual fit lids equipped with a locking device.

The 18½-cubic-foot freezer will hold more than 500 pounds of frozen food and is intended for large-scale gardeners. It will have two large food storage compartments and a separate freezing space, each of which is covered by a locking lift-lid. It will be powered with 1/3 hp. unit. The freezer will be small enough to be carried through a 30-inch door.

Norge will round out this line with a rugged, 26-cubic-foot home and farm freezer for farmers and suburbanites who want to process and store food for off seasons. It will be a three-lid, three-compartment model, providing 20½ feet of space for storing and 5½ for freezing. A ½ hp. heavy duty power unit will be used.

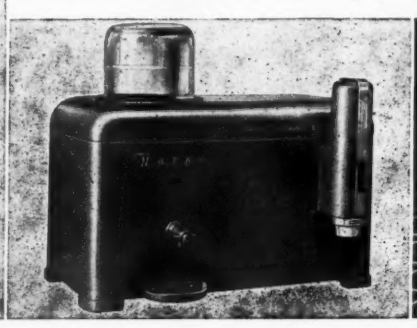
CAMFIELD CAMPAIGN ON AUTOMATIC TOASTER

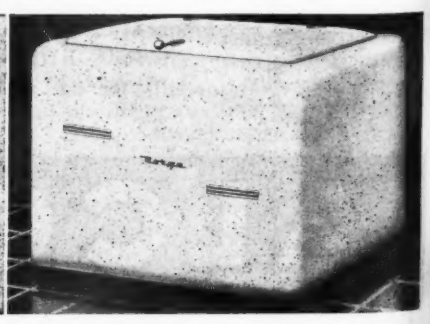
An advertising campaign for the new Camfield automatic toaster has been launched in a group of merchandising magazines. The first of these advertisements appeared in the August issues. It showed an attractive container in which the Camfield automatic toaster is to be packed.

The advertisement describes the "Equa-Therm", an ingenious, exclusive Camfield feature. This is a thermostat designed to secure perfect toasting heat regardless of voltage fluctuations. It provides a control of the toaster timing mechanism through the amount of heat developed.

Also described is the trigger-quick Camfield "Finger-trip" release, which conveniently releases the pop-up mechanism at a touch by the housewife.

The campaign also introduces the company trade mark, designed by Sidney A. Wells, of the Chicago Office of McCann-Erickson Inc. This presents the name of Camfield in block letters with a wavy line underneath denoting the location of the plant on the Great Lakes, and a star over the letter "i", signifying a constant effort toward achievement.





Three new Norge products scheduled for early production.

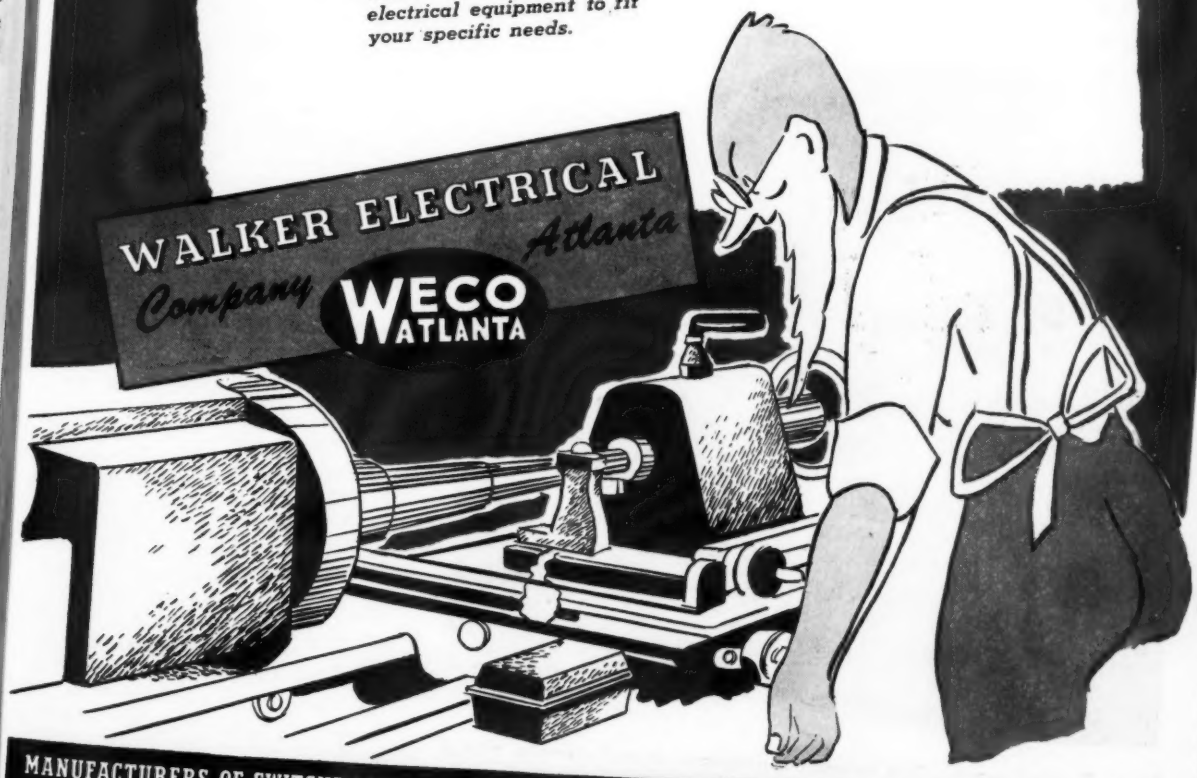
The Professor

IS GETTING SET FOR FULL CIVILIAN PRODUCTION

Complete victory enables us again to turn our full production towards fulfilling your requirements.

The demands of war limited our service to you more than was our choice, but through serving the armed forces of our country we have gained the satisfaction of a job well done and a store of experience that will be invaluable in offering you a more comprehensive service.

Soon orders on file will be filled and schedules can be planned to make deliveries in accordance with your requirements, but now our engineering department can help you in carrying forward your plans for the modernization of your system. Walker will plan and build electrical equipment to fit your specific needs.



MANUFACTURERS OF SWITCHBOARDS • PANEL BOARDS • SERVICE EQUIPMENT • METAL ENCLOSURES

HOOVER COMPANY RESUMES PRODUCTION

Production of Hoover vacuum cleaners has been resumed on a *limited* basis in the Hoover Company's factory at Wheeling, W. Va., according to an announcement by H. W. Hoover, president of The Hoover Company, North Canton, Ohio. These are the first Hoover cleaners to be manufactured since April, 1942, when production of all vacuum cleaners was stopped on government order. Since that date, The Hoover Company, which started on defense work back in 1940, has been on war production and for it have been given the Army-Navy "E" Award four times in succession.

Although continuing on large scale war work, The Hoover Company acted promptly on the government's release. The first new Hoover cleaners to come off the production line are known as the Hoover cleaner Model 27. This model had been put into production but not shown to the public at the time vacuum cleaner production was stopped, which is the reason why Hoover is able to get under way so promptly. It is a brand new cleaner, and has never before been offered to the public. Its price is the lowest ever offered for so many advances in ease, speed, convenience, and thoroughness of cleaning. It is every inch a Hoover in quality and engineering.

Outstanding feature of the new Hoover is the addition of "Instant Conversion," a convenience formerly offered only on Hoover cleaners selling at a higher price. "Instant Conversion" means that the housewife is able to quickly convert the Hoover from a rug cleaner to a cleaner for draperies, upholstery and other types of above-the-floor cleaning, as well as for bare floors and linoleum—inserting the cleaning tools in the side of the cleaner—just as easy as pushing in a light plug.

Hoover again provides its exclusive air cushioned vibration — a patented cleaning principle that gently dislodges the deeply imbedded dirt and brings it to the top where suction carries it away.

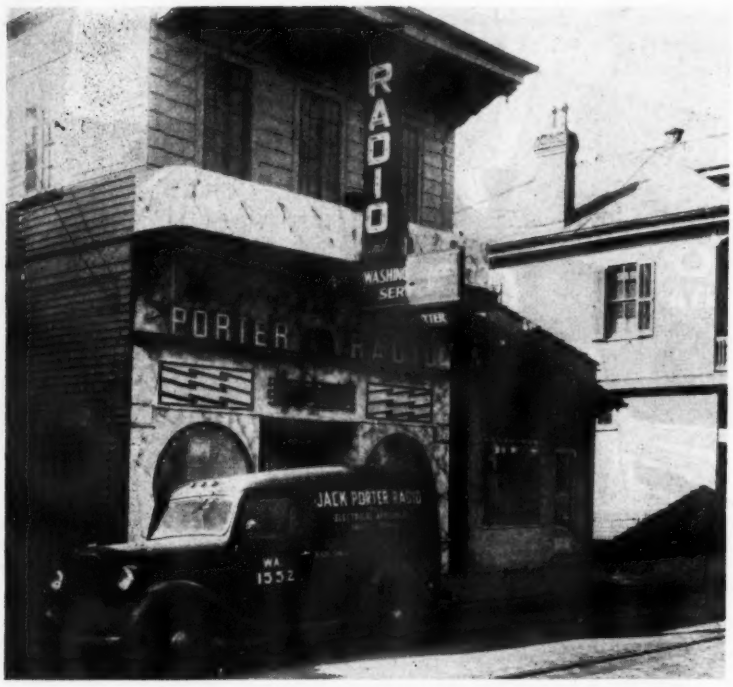
FRIGIDAIRE PRESENTS STORE PLANNING PROGRAM

In cooperation with Raymond Loewy Associates, world famous designers, Frigidaire Division, General Motors Corporation of Dayton, Ohio is presenting a store planning program created exclusively for their dealers in order to bring more selling efficiency into the point-of-sale activity.

Frigidaire many months ago began an extensive research program to determine just what display and selling problems appliance dealers are confronted with and how those problems might best be met in the future. Raymond Loewy Associates which has had many years experience in planning merchandise arrangements and store layouts for many of the nation's leading stores, cooperated in the development of plans to answer these problems. The result of this combined effort is a new store planning guide titled "Design for Selling." This guide, one of the finest of its kind ever developed, is a 38-page volume full of practical information and beautifully illustrated.

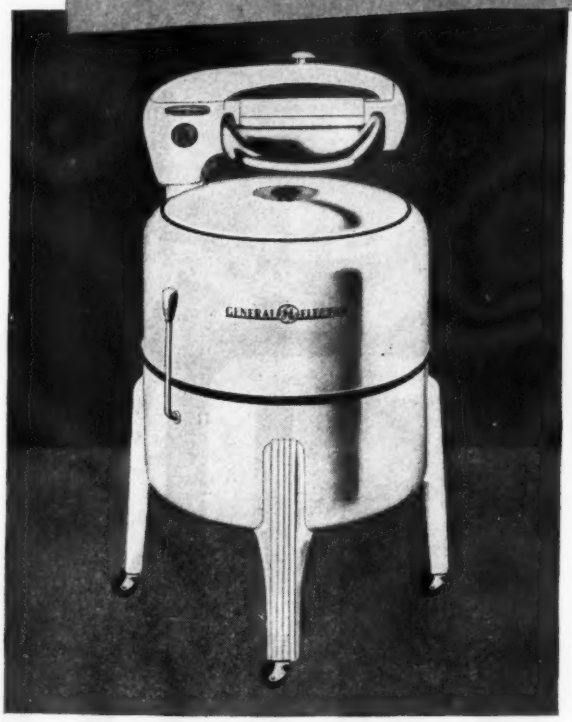
As its name implies, "Design for Selling" applies sound principles of design and arrangement, not only to make the dealer's store more attractive, but more important, to provide him and his salesmen with more effective selling facilities.

The new store planning guide is based on the space needs of the product, the customer and the salesman. The basic outstanding features of the "Frigidaire — Raymond Loewy" idea goes far beyond mere surface suggestions. The plans organize the store space into selling units. The number of these units that will be required in a dealer's store naturally depends on the size of the store and the needs of the business. This unit principle gives a flexibility of application which makes the "Design for Selling" plans practical and usable by any dealer, any type of store, any size department, and any style of decoration. Into a unit of space is built the "Frigidaire Selling-Station" and the elements which make this innovation a combination of beauty and efficiency. The Selling Station is unique and inviting in appearance and accommodates a variety of product combinations. Greater



Porter Radio Company, New Orleans, supplements its radio service with a household washing machine repair service. If there's anything to the "whistle while you work theory" there at least should be music while you wash and Mr. Porter intends to supply both desires.

G-E HOME LAUNDRY EQUIPMENT IS BACK!



Famous G-E One-Control Wringer Washers are rolling off the production line, *now.*

All G-E Home Laundry Equipment backed up by coast-to-coast advertising. In leading, top-circulation magazines every month. On the air, over a nationwide network, 5 days a week.

TELL YOUR CUSTOMERS to listen to Art Linkletter, in the "G-E House Party," every afternoon, Monday through Friday, 4 p. m., E.W.T., CBS.

o Biggest market in appliance history waiting! Feature the complete G-E Line!

Now you can take orders for General Electric Home Laundry equipment!

The G-E Home Laundry factory is again manufacturing washers, ironers, and dryers.

You'll get your first G-E One-Control Wringer Washer very soon. And the complete line will follow, fast.

Big Preference for G.E.!

There's a huge market waiting to snap up laundry equipment. (WPB says 4,621,000 people want washers.) And there's a big preference for General Electric products. (Surveys show that 53 out of 100 women believe G.E. makes the best electrical appliance for the home.)

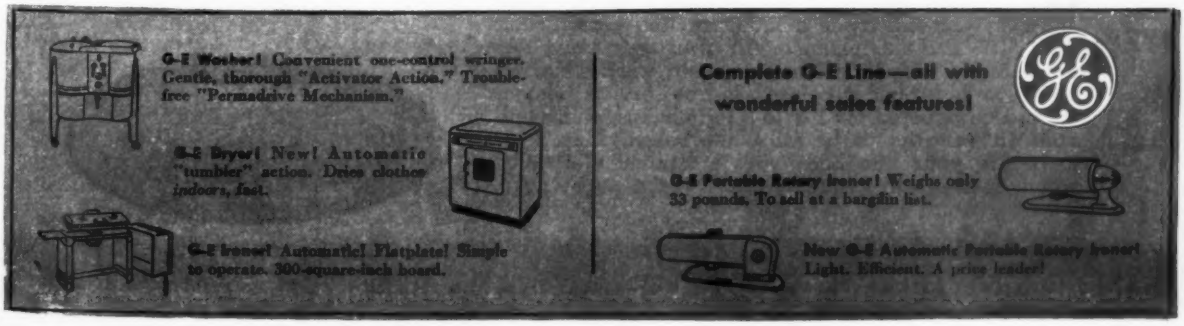
So plan to feature the complete G.E. line—for a big, big future. Because *we're* planning great things for the future, too. Bigger than ever promotion. Constant improvements in design. And a new G-E Automatic Washer that's going to revolutionize the industry!

Get Started Now!

Send for the G-E Self-Starter Package. It contains all the sales-promotion material you need to get back in the home-laundry business. Your distributor has it. Get it *today!*

"THE APPLIANCES MOST WANTED BY MOST WOMEN"

GENERAL ELECTRIC


G-E Washer! Convenient one-control wringer. Gentle, thorough "Activator Action." Trouble-free "Permadrive Mechanism."
G-E Dryer! New! Automatic "tumbler" action. Dries clothes indoors, fast.
G-E Ironer! Automatic! Flatplate! Simple to operate. 300-square-inch board.
Complete G-E Line—all with wonderful sales features!
G-E Portable Rotary Ironer! Weighs only 33 pounds. To sell at a bargain list.
New G-E Automatic Portable Rotary Ironer! Light. Efficient. A price leader!

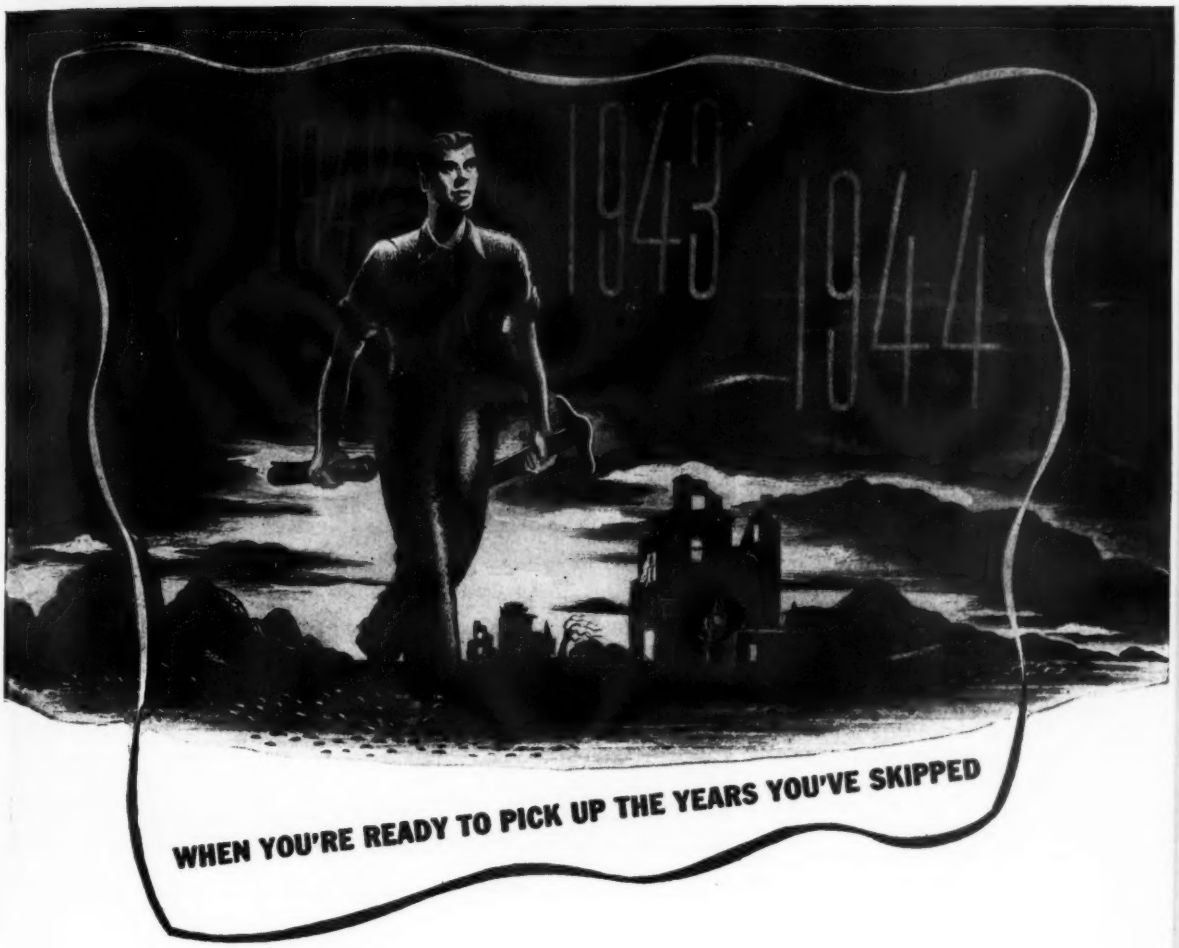
POWERS

THE BODY ENGINEERED TO DO YOUR LINE WORK BETTER

For efficiency and economy, a POWERS Line Body is a *must* for line construction and maintenance. All over the country this standardized body for all-purpose utility work is making new records for enduring, trouble-free service. Designed and engineered for 1½ to 2 ton chassis, and available in lengths to fit all wheelbases. Plan now to secure your line body with a minimum of delay when chassis are again available. Write us TODAY.

ALL-STEEL

McCABE POWERS AUTO BODY CO. · 5901 N. Broadway · St. Louis 15, Mo.



WESTON CAN TELL YOU LOTS

That's NEW about Sensitive Relays!

Many engineers concentrating on specialized wartime problems have had little opportunity to keep posted on all new developments in the electrical field. Many of these developments, too, could not previously be revealed for security reasons.

But now, with civilian activities in closer sight, these engineers will want to find out how far electrical science has moved forward in the years they have skipped.

In sensitive relays, for example, much has happened which will be of vital importance to design engineers. New sensitivities have been achieved by WESTON . . . making available relays that provide positive control on extremely minute quantities of electrical energy. New compactness has been achieved, too; overcoming former space limitations through extremely small-size and light-weight.

To make sure that your post-war products, or manufacturing processes, are not handicapped by lack of knowledge about these new sensitive relay developments, ask the WESTON representative in your vicinity to quickly bring you up-to-date. Or, write direct to . . . Weston Electrical Instrument Corporation, 686 Frelinghuysen Avenue, Newark 5, New Jersey.

Weston *Instruments*

ALBANY • ATLANTA • BOSTON • BUFFALO • CHICAGO • CINCINNATI • CLEVELAND • DALLAS • DENVER • DETROIT • JACKSONVILLE • KNOXVILLE • LOS ANGELES • MERIDEN
MINNEAPOLIS • NEWARK • NEW ORLEANS • NEW YORK • PHILADELPHIA • PHOENIX • PITTSBURGH • ROCHESTER • SAN FRANCISCO • SEATTLE • ST. LOUIS • SYRACUSE
In Canada, Northern Electric Co., Ltd., Powerlite Devices, Ltd.

conveniences for both the customer and the salesman are "built-in"; yet the Frigidaire Selling-Station is neither "dated" or "faddish."

This combination "Frigidaire — Raymond Loewy" development contains a wealth of information—detailed working drawings—color schemes —store front design, store location etc., which make it easy for the local architect and builder to adapt these ideas to the modernization of any Frigidaire dealer's store or department. Full-color sketches indicate the transformation it can accomplish.

WESTINGHOUSE TO MAKE AUTOMATIC DISHWASHER

An entirely new design of fully automatic dishwasher, that for the first time will take this kitchen appliance out of the luxury class and into the average home, will be introduced by the Westinghouse Electric Appliance Division, Mansfield, Ohio, when full consumer production is resumed, it has been announced.

At the same time, J. H. Ashbaugh, vice-president in charge of the Appliance Division, disclosed that Westinghouse also will manufacture an electric unit, called the "Waste-Away," that will grind up garbage and flush it down the kitchen drain.

"To operate the new automatic dishwasher, the housewife simply places her dishes, glassware and silver in the square, top-opening unit, closes the lid and presses a button. The machine then sprays the dishes, washes them, rinses them twice, cleans and drains itself automatically and then shuts off. The complete cycle requires about 12 minutes. Because the water is 150 degrees Fahrenheit, about 30 degrees hotter than human hands ordinarily can stand, dishes are far cleaner than when washed by hand," Mr. Ashbaugh said.

"The new dishwasher," he continued, "in addition to being fully automatic, has a capacity one-third greater than our prewar models. It is expected that the basic unit without a cabinet, that is, one that will fit into a work surface next to the sink, will sell for less than $100. In use three times a day, it will consume only 16 cents worth of electricity a month, at a rate of 2 cents per kwh."

Anticipating a national market for 600,000 dishwasher units annually in postwar years, Mr. Ashbaugh pointed out that the new Westinghouse unit is designed to appeal to the housewife who does her own dishes and that engineering was directed toward the development of a new type machine at lower production costs than prewar, when non-automatic models cost from $160 to $330.

Basic unit of the new Westinghouse dishwasher may sell for less than $100.

From this basic dishwasher design, units to fit into various work surfaces, as well as semi-cabinet and full cabinet models, will be produced.

The dishwasher and the Waste-Away can be installed separately or together and are easy to incorporate in modernization plans for kitchens and new housing programs, because the builder can install them with any kitchen sink plan that is desired.

To check the design efficiency of the new automatic dishwasher, Westinghouse engineers have washed 50,000 scientifically-dirtied dishes—which, if stacked, would make a pile of dishes almost a mile high!

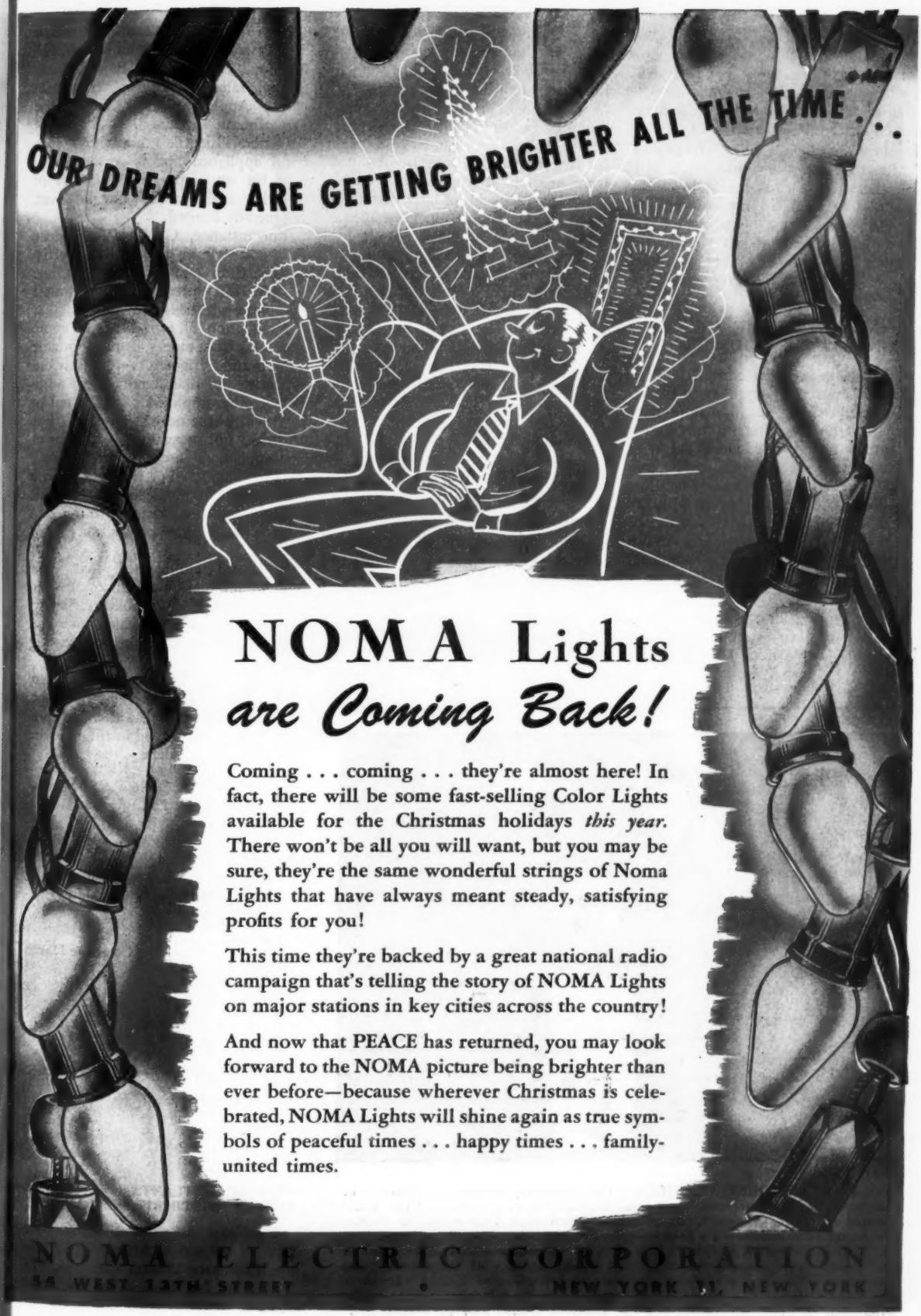
A new development in water application, a fast moving shower of little water pellets that literally scour the dishes spotlessly clean, has been tested under the most exacting conditions.

"Under no circumstances are even the lightest of dishes, such as a fine, small glass, moved about by the water pellets within the dishwasher," Mr. Ashbaugh said. "Nor have we found it necessary to anchor any of the dishes that are placed in the machine. Its water action is thorough, but gentle.

"The constant action of the fine water pellets is equivalent to washing dishes with 70 to 75 gallons of water, although only six quarts of water are used in the machine, or no more water than the housewife would use in an average size dishpan."

The new model has three rinse cycles, one pre-wash and two following the five-minute wash period. Once the machine is started no attention by the housewife is necessary during the entire dishwashing operation. Nor need she return to take out the dishes, since the machine automatically cleans and drains itself, then shuts off, unless she wishes to speed the drying of them. Then she opens the top when the machine shuts off and the very hot water left on the dishes evaporates and they dry themselves quickly and completely.

The companion appliance to the dishwasher, the Waste-Away garbage disposer, will banish the unsanitary sight of a kitchen cluttered up with



NOMA Lights *are Coming Back!*

Coming . . . coming . . . they're almost here! In fact, there will be some fast-selling Color Lights available for the Christmas holidays *this year.* There won't be all you will want, but you may be sure, they're the same wonderful strings of Noma Lights that have always meant steady, satisfying profits for you!

This time they're backed by a great national radio campaign that's telling the story of NOMA Lights on major stations in key cities across the country!

And now that PEACE has returned, you may look forward to the NOMA picture being brighter than ever before—because wherever Christmas is celebrated, NOMA Lights will shine again as true symbols of peaceful times . . . happy times . . . family-united times.

NOMA ELECTRIC CORPORATION
58 WEST 13TH STREET • NEW YORK 11, NEW YORK

food refuse and the nasty task of wrapping up wet garbage and taking it to a refuse can outdoors. It will substitute in its place the mere emptying of such wastes into the sink drain opening of the unit.

The disposer is easy to operate. After food is put into it, a simple flick of the starter switch sets it in operation. Cold water is kept running into the disposer during operation for self draining of the unit. It takes but a few seconds to dispose of the food waste left from an average meal.

ANNUAL FIXTURE DESIGN CONTESTS ANNOUNCED

To further stimulate interest in improved postwar lighting, Sylvania Electric Products, Inc., has announced the second of its annual fixture design contests for anyone connected with the lighting division of a public utility. Twenty-two cash awards totalling $2,000, and ranging from $500 to $50, will be made in addition to certificates for all winners and an attractive trophy for utility companies employing those who qualify for the four major awards.

The purpose of this year's competition is to develop an improved design for a commercial fluorescent fixture using four 96-inch Sylvania Long Slim type fluorescent lamps. The type of design submitted should be suitable for general lighting in the main floors of department stores in a ceiling-mounted position.

Details of these lamps and rules for the competition may be obtained from Sylvania at Salem, Mass. Entry blanks postmarked not later than midnight September 30th, 1945, will make qualified contestants eligible for awards covering designs submitted on or before December 31st, 1945.

Designs submitted will be judged by Eugene Burke, industrial designer, of Burke and Kober, Los Angeles; R. J. Chapin, superintendent of construction and maintenance, Marshall Field and Co., Chicago; Lurelle Guild, industrial designer, New York; and E. M. Strong, professor of electrical engineering, Cornell University.

G.E. ANNOUNCES APPLIANCE LINE

The General Electric Company has announced the electrical appliances it will offer the public in the months immediately ahead. With five exceptions, all models are basically the same as those it sold just before the war.

"To speed our output of electrical appliances, we have gone back to slickly modified 1942 models which do not require new machine tools, fixtures and facilities," C. R. Pritchard, general sales manager of the company's Appliance and Merchandise Department, explained.

General Electric's household electrical appliance line is complete except for sunlamps. The number of models available in each line, however, is generally limited.

For instance, G. E. will produce only one style of washer, three refrigerators, three ranges, three irons, one roaster. The water heater line is most complete, with six models.

Production of four types of appliances—electric clocks, irons, portable heaters and refrigerators—is already under way, and manufacture of a number of other appliances is expected to start within the next few weeks. "But this does not mean that all models of all appliances are in the works," Pritchard said. "For example, we are now producing two automatic irons. A light traveling iron and our steam iron will go into production about January."

Pritchard emphasized that even present production schedules are subject to change. Availability of materials, factory space, machine tools and fixtures and labor are the determining factors.

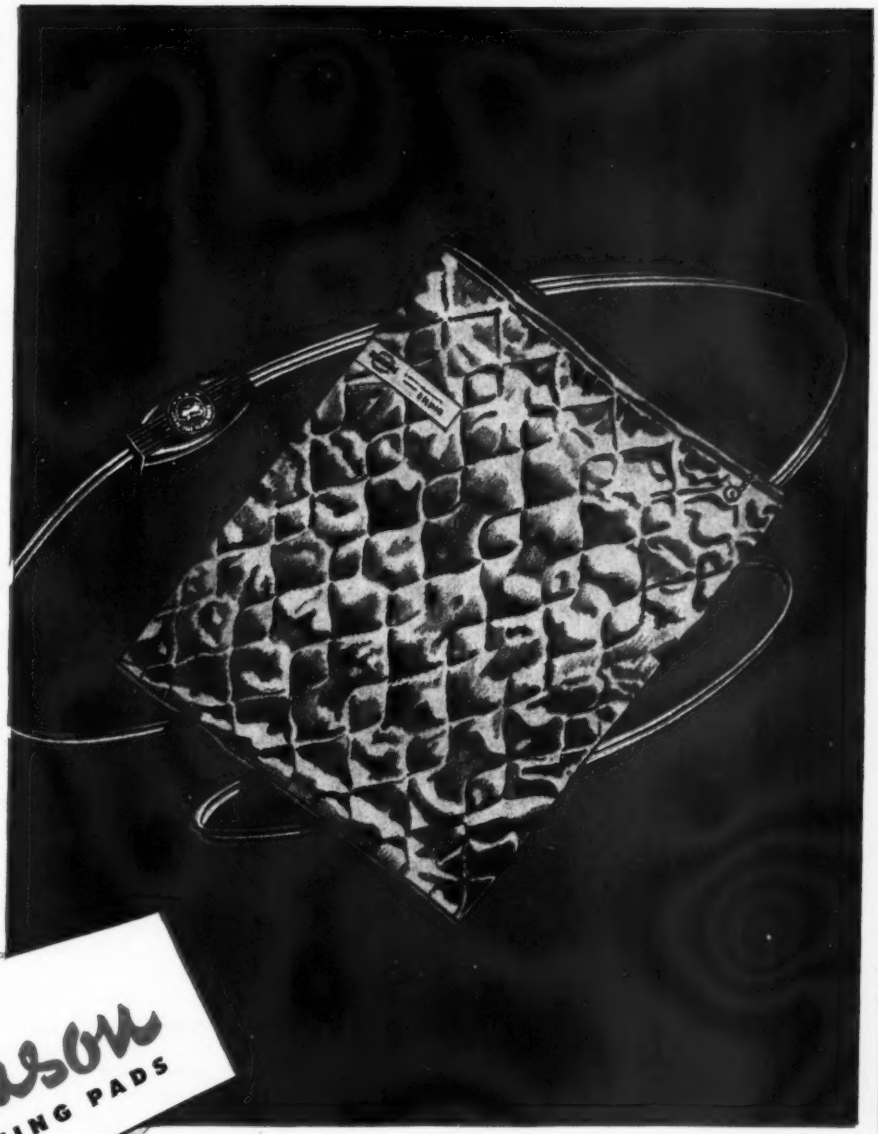
As disclosed by Pritchard, the new G-E appliances will be as convenient, efficient and sturdy as the best prewar models. Included in the lines are the following models:

Appliance	Number of Models
Refrigerator	3
Home Freezer	1
Range	3
Water Heater	6
Washer	1
Dryer	1
Flatplate Ironer	1
Rotary Ironer	2
Dishwasher	3
Disposall	1
Storage Cabinet	Complete Line
Iron	4
Mixer	1
Toaster	2
Roaster	1
Coffee Maker	4
Waffle Iron	3
Grill	2
Portable Heater	2
Heating Pad	2
Heat Lamp	1
Fan	1
Clock	3
Automatic Blanket	1
Cleaner	4

UTILITY PRESIDENT HONORED—The honorary degree of Doctor of Engineering was conferred upon John W. Carpenter, president of the Texas Power & Light Company, by Southern Methodist University, in Dallas, Texas, at that institution's commencement exercises recently. In presenting the degree, President Umphrey Lee of S. M. U. characterized Mr. Carpenter as "president of one of the important public utilities of the country who has spent a lifetime developing the natural resources of Texas; advisor to the Congressional Committee on National Rivers and Harbors; civic leader interested in every movement for the good of Dallas and the Southwest."

TWO NEW ATLANTA SUPPLY DISTRIBUTORS

Two new supply distributors have recently opened in Atlanta. They are the Thompson-Wilson Co., Inc., 775 Spring St., N. W., and the Diamond Electric Supply Co., 882 Forsyth St.



Again it's SAMSON Heating Pads for quality features that mean volume sales and customer satisfaction! Patented SAFE-T Circuit, with 3 Fixed Heats, each controlled by 4 precision thermostats. Permanently sealed 100% wetproof cover of Du Pont Fairprene. Zelan-treated water repellant and stain resistant extra covers. Cushion-comfort padding. Strain-relief switch with exclusive "Touch-Tell" indicator for night use. 8-foot cord. Each pad individually boxed to form a compact, self-selling counter display.

Samson
HEATING PADS

FACTS ABOUT SAMSON UNITED TODAY AND FOR THE FUTURE

As you read this, another Samson electrical appliance—the Samson Heating Pad—is now in production. Initial shipments will be limited, but as fast as more of our war-expanded facilities are released for peacetime production, larger and larger quantities will go forward to Samson distributors.

In addition to the Samson Duo-Dial-A-Heat Flatiron which dealers are already receiving, the Samson Safe-flex Rubber Bladed Fan and the Samson Variable Control Table Range will be made available as soon as conditions permit. Watch for news of these and other Samson profit-making appliances.

ELECTRICAL SAMSON APPLIANCES

SAMSON UNITED CORPORATION, ROCHESTER 10, N.Y.

Samson United of Canada, Limited, Toronto

3,500,000 NEW RADIO SETS BY END OF YEAR

The possibility of approximately 3,500,000 new radio sets for civilian users by the end of the year is indicated in the sweeping cancellations of military contracts for electronic equipment that have been planned, Melvin E. Karns, director of the War Production Board's Radio and Radar Division, has announced.

Mr. Karns said that the cancellations would amount to more than 80 per cent of the total contracts outstanding on July 1, 1945. Remaining military orders will consist of a limited amount of new procurement and research contracts, plus continuation of some existing contracts on a reduced basis. Such production will be protected by WPB authority to grant special priorities assistance when needed.

The transition from military to civilian production was expedited for the industry through the modification July 26 of Order L-265 (electronic equipment), now revoked, which permitted manufacturers of components to order materials and start production for civilian use. The availability of components will be a major factor in the speed with which producers turn out finished radios and other electronic equipment.

Mr. Karns said that in general there will be a supply of components ample to meet most needs of the industry. Some items may be short, he said, but in most such instances it will be possible to use substitutes. It is expected that a quantity of components will shortly be available from surplus stocks. Further gains are anticipated from longer production runs made possible by less precise specifications of civilian designs.

APPLIANCE PROGRESS AT GENERAL MILLS

Plans for production of home appliances by General Mills are actively under way in the company's Mechanical Division, at Minneapolis. Actual production—now that WPB has lifted the ban on manufacture of electric appliances — is contingent upon the plant's war work and upon availability of materials and equipment.

While the plant's 1400 employees are turning out precision instruments for the Armed Forces with an efficiency and skill that has won them three renewals of their Army-Navy "E" award, General Mills research and postwar planning groups have for the past three years been working out a program for peacetime production. Mechanical Division inventors, product designers, engineers, production men, technicians, market analysis experts and sales promoters — all have had a hand in preparations for the manufacture of a new family of household appliances.

Devotional research and testing have been completed on three items: two models of automatic electric irons with a unique temperature control for heat uniformity; two automatic electric coffee makers with a new brewing mechanism to speed and improve coffee-making; and several sizes of non-electric pressure saucepans. These will be the first to reach distributors. Other appliances are in various stages of development.

Under the direction of Roscoe Imhoff, Mechanical Division vice-president in charge of appliance sales, and sales manager John A. Sullivan, distribution policies have been formulated and sales territories established. District managers will take over their territories around November 1; and distributors will be interviewed and appointed shortly thereafter.

"Dougan, I sent you out for a box of fuses two years ago, and here you are just now coming back! You're fired!"

MEIER ELECTED CHAIRMAN N. C. SECTION AIEE

Otto Meier, Jr., assistant professor of electrical engineering at Duke University, Durham, N. C., has been elected chairman of the North Carolina section of the American Institute of Electrical Engineers.

ELECTRICAL INSPECTORS TO MEET IN ATLANTA

The annual meeting of the Southern Section, International Association of Electrical Inspectors, will be held in Dallas, Texas, October 29, 30, 31, 1945, with headquarters in the Baker Hotel.

The meeting will be devoted to administrative business, reports and election of officers, reports of committees, and discussion of Article Committees reports to the Electrical Committee.

In conformity with regulations of the Office of Defense Transportation, attendance will be restricted to 150 exclusive of those residing within commuting distance of Dallas and who will not use hotel facilities. The 150 will include the I.A.E.I. president and secretary, section officers, representatives of the electrical committee, executive council members, and the chairmen of committees, in addition to those within before mentioned geographical limits.

All business resulting in formal motions and resolutions later will be referred to the membership by mail ballots and a majority of ballots returned will determine results.

To avoid confusion, attendance notices will be sent only to those included as above, vacancies from this list will be apportioned to chapters, and the members receiving formal notices are requested to notify the secretary of their intentions.

This little soldier has been away, too, but now he's back from the wars, eager to become, again, as much a part of *home* as his mother's new Premier!

Yes, the famous Premier is back—in nearly 10,000 dealers' stores all over the country! Of course the manufacturers of Premier cannot possibly make enough Premier cleaners at first to satisfy the pent-up demand. In fact, the entire vacuum cleaner industry will be unable to fill the need for cleaners for some time to come.

But that only means that you'll be smart to visit your nearest Premier dealer at once and get *your* order in early, under the . . .

PREMIER PRIORITY PLAN

At your dealer's store you will receive a numbered Priority Certificate entitling you to delivery of your Premier in the order of your registration. "First Come—First *Reserved*" is the Premier way of fair selling. Get your Premier Priority Certificate soon—and you'll get your new Premier *sooner!*

ELECTRIC VACUUM CLEANER COMPANY, INC.
Cleveland 10, Ohio
THE PREMIER VACUUM CLEANER CO., LTD., Toronto, Canada

P.S. (Premier Saving)

When you buy your new Premier from a retail store it will cost you $10 to $20 less than it would have cost if Premier maintained its own house-to-house "specialty" salesmen. Selling Premiers through retail stores only makes this saving yours!

Remember, if you are tempted to buy a cleaner of unknown name and unproved quality (just because you might be able to get such a cleaner a little sooner), the familiar American products that were dependable before the war, will be even more dependable now. It is certainly true that the new skills Premier has learned and perfected in making precision military equipment will make the Premier—more than ever before—"*All that the name implies.*"

PREMIER
"All That the Name Implies"

This advertisement appears in Saturday Evening Post, Sept. 29, 1945

. . and look what's back of *you!*

This is the kind of Premier advertising that's bound to bring buyers into your store—*fast!* They'll get a demonstration of a vacuum cleaner that has long been a household word. *You'll* get the orders.

---Note the P.S.

ELECTRICAL EXCHANGE ANNOUNCES APPOINTMENTS

Sectional appointments for the ensuing year for the Southeastern Electric Exchange have been announced by President E. L. Godshalk. These are as follows: accounting, H. Atwood Hitch, assistant comptroller; Virginia Electric and Power Co., Richmond, Va.; commercial, Hugh G. Isley, general sales manager, Carolina Power and Light Co., Raleigh, N. C.; employee activities, Homer M. Pace, vice-president, South Carolina Power Co., Charleston, S. C.; engineering and operation, Henry B. Sargent, vice-president and general manager, Mississippi Power and Light Co., Jackson, Miss. With the exception of Mr. Hitch, each of these chairmen served during the past year.

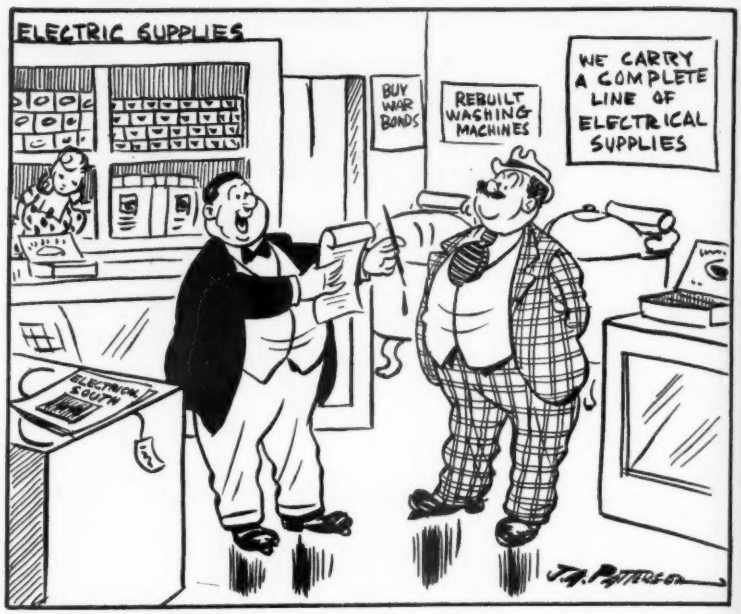
The several sub-committees of the commercial section that have been functioning for the past several years will be continued, with the following sales executives as chairmen, each having served the past year: agricultural development, Dan E. Stewart, assistant to vice-president, Carolina Power and Light Co., Raleigh, N. C.; industrial power, C. E. Anderson, industrial and commercial director, Virginia Electric and Power Co., Charlottesville, Va.; and residential and commercial, J. S. Sutherland, sales promotion manager, Alabama Power Co., Birmingham, Ala.

The fall conference of the Engineering and Operation Section is scheduled to be held at the Sir Walter Hotel on October 4th and 5th, in Raleigh, N. C.

UTILITY COMPANIES SEEK SANTEE POWER

In preparing for the postwar power needs of Columbia and central South Carolina, the South Carolina Electric and Gas Company, in conjunction with the South Carolina Power Company of Charleston, has opened negotiations with Santee-Cooper officials for the joint purchase of 200,000,000 kilowatt hours per year of its surplus energy, it has been announced.

For several years the Columbia concern has given consideration to the installation of a large, efficient, high-pressure steam generating unit. Believing the Santee Cooper hydro electric project may have a large amount of surplus firm energy available for sale in the near future due to curtailment of power requirements of certain war industries it is now serving, the South Carolina Electric and Gas Company has decided in favor of the hydro electric project.



"Here's the purchasing order, Mr. Mystiuschionsky — all it needs is your John Hancock."

S. C. McMeekin, vice-president of the South Carolina Electric and Gas Company, said that each company is asking for 100,000,000 kilowatt hours each and added that the joint purchase would "make available a wider, more equitable distribution of power."

In his announcement, Mr. Mc Meekin declared the proposal now under consideration would give the state-owned power project the right to recapture any or all of the firm power contracted for.

"They will have the privilege of inducing new industries to come to the state and reclaiming any part or all of the proposed contract to serve the new industry. Until the time comes when new industry requires the power, the proposal will give Santee-Cooper a firm outlet for all of its power," he said.

OKLA. UTILITY PLANS EXPANSION PROGRAM

The Public Service Company of Oklahoma has started a two-year $5,000,000 expansion and improvement program, R. K. Lane, president of the utility announces.

About half of the money set up will be used for new boilers and generating equipment. Work is now in progress on a new boiler power station at the Tulsa plant, which will increase its output 9,000 kilowatts. The new unit was scheduled to be in operation by September 1.

An additional boiler and turbo-generator to be installed at the Tulsa plant during 1946, will increase the generating capacity of the system from 142,000 kilowatts to 172,000 kilowatts.

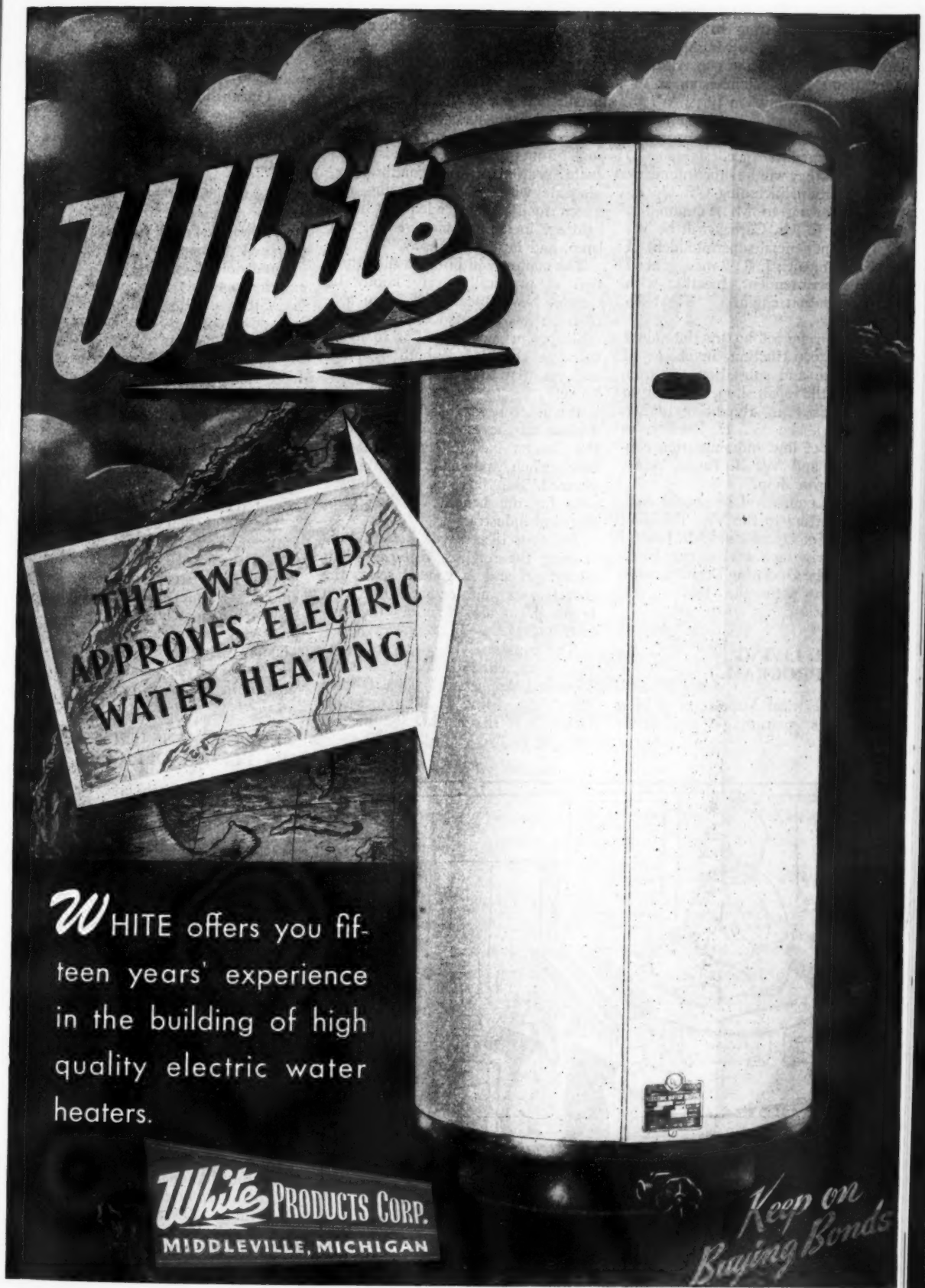
Improvements to the transmission line system will include installation of oil circuit breakers and high speed and carrier current relays to make the system more flexible; lightning protective equipment on major transmission lines; rebuilding and improving distribution systems in Bartlesville and several other towns; and expenditures for an additional gas supply at McAlester.

INDUSTRIAL RELATIONS DEPARTMENT ORGANIZED

An Industrial Relations Department has been organized by the Georgia Power Company, of Atlanta, Ga., to devote its entire attention to matters of importance to employees of the company. A. S. Goss has been appointed manager of this department and will report to the president.

At the same time, the following changes in the company's General Office Operating Department were announced by J. M. Oliver, vice-president in charge of operations:

J. F. Pennington will be general superintendent of transmission and distribution, in charge of the work formerly supervised by him as superintendent of wholesale operations and, in addition, the work formerly supervised by A. S. Goss as superintendent of retail operations.


White
THE WORLD APPROVES ELECTRIC WATER HEATING
WHITE offers you fifteen years' experience in the building of high quality electric water heaters.
White PRODUCTS CORP.
MIDDLEVILLE, MICHIGAN
Keep on Buying Bonds

T. J. Allen will be superintendent of transmission, reporting to Mr. Pennington. Reporting to Mr. Allen will be E. H. Wildberger, as supervisor of substations; A. C. Henderson, as supervisor of transmission lines; W. P. Spier, acting supervisor of communication; and B. F. Colmer, supervisor of building maintenance.

M. L. Cathey will be superintendent of distribution, including Gas Operations, reporting to Mr. Pennington. Reporting to Mr. Cathey will be W. D. O'Brien, general superintendent of appliance repairs; J. R. Raney, general meter superintendent, together with the distribution engineers of that department.

A. B. Greene will be superintendent of special construction, in charge of special line and substation construction, and the repair shop, reporting to Mr. Pennington. Reporting to Mr. Greene will be W. E. Bradley, as supervisor of line and substation construction; and W. B. Payne, supervisor of repair shop.

R. O. Loomis will be special engineer, reporting to the Vice President in Charge of Operation. Mr. Loomis will supervise such work as may be required of the Operating Department in connection with the budget and special duties.

BETTER LIVING HOME PROGRAM

The Electrical Association of New Orleans is sponsoring "The Better Living Home" Program, which is designed to build business for the entire industry.

One of the main features of the program is a contest to promote the installation of appliances, particularly those which are less generally accepted, such as dishwasher, garbage disposer, ironer, automatic laundry, adequate ventilation, air conditioning, adequate wiring, quick freezing and frozen food storage, adequate home lighting, including sterile lamp, sun lamp, and infra-red lamp.

The contest will bring to the attention of practically every family in Greater New Orleans the advantages of these less accepted electrical conveniences in such a way as to make them be classified as both desirable and essential to the comfort of the home.

It will secure for these conveniences a place on the modernization list of the Greater New Orleans housewife now when purchases are being planned, and thus stimulate postwar sales for the benefit of the entire electrical industry.

An attractive, small booklet, describing the services, featuring their advantages and in general terms the cost to own and operate, has been prepared. It also describes the contest.

The contest is based on an essay, not to exceed 250 words, on "The Electrical Appliance I Have Chosen To Make Mine a Better Living Home." It should describe the entry's reasons for selecting the appliance most desired in her postwar home.

The booklet will be distributed to practically every home in Greater New Orleans having an electric meter.

NEW GENERATING STATION PLANNED FOR NEW ORLEANS

A $9,000,000 program for expanding the power generating facilities of New Orleans Public Service, Inc., is proposed for approval by the city Commission Council. The project calls for construction of a new 35,600 kilowatt generating station adjacent to Industrial Canal factories, with substations and circuits to connect it with existing stations; and replacement of three small turbo-generators and several low-pressure boilers with a single 23,000-kilowatt turbo-generator.

According to A. B. Patterson, president of the Public Service, priorities have already been granted for the project and work is ready to start as fast as materials can be secured.

The $9,000,000 cost will be raised, Patterson proposes, by "issuance and sale, when needed, of 120,000 shares of common stock or such lesser amount as would be necessary to provide approximately $3,000,000; issuance and sale of approximately $1,500,000 in notes, when needed, and by using cash on hand and cash deposited in our property fund."

NEW ORLEANS CHAPTER IES ELECTS OFFICERS

Raymond Frischhertz, engineer with the Times-Picayune, was recently elected chairman of the New Orleans Chapter, Illuminating Engineering Society for 1945-46. Other officers elected were R. C. Paslay, with Louisiana Power & Light Company, secretary-treasurer, and Mason Guillory, with New Orleans Public Service, Inc., F. R. Reindl, with Benjamin Electric Mfg. Co., and J. M. Supple, with Eaco, Inc., members of the board.

At the first meeting, the new officers and W. A. Feuillan, Jr., with Lighting Fixture & Electric Supply Co., Inc., and regional vice-president-elect, Southern Region, IES, completed plans for a joint meeting of the Louisiana Architects Association, the American Institute of Architects, and the Illuminating Engineering Society to be held October 4, subject: Lighting . . . Design for Seeing; speaker: Frank B. Lee, district engineer, General Electric Company, Lamp Department, St. Louis, Mo.

"You got me, boss — all I know is he wants to know when he can get one of our new electric carpet sweepers!"

HOTPOINT

NOW IN PRODUCTION

Now, with the ending of World War II, Hotpoint again turns its tremendous resources to the manufacture of Hotpoint electric appliances.

Electric Ranges
Refrigerators
Home Freezers
Automatic Dishwashers
Garbage Disposalls
Electric Sinks
Cabinet Sinks
Kitchen Cabinets
Clothes Washers
Electric Clothes Dryers
Rotary Ironers
Flat Plate Ironers
Electric Water Heaters

Every Hotpoint dealer is aware of the vast waiting market for quality electric appliances. And now, more than ever, the Hotpoint Selective Dealer Franchise assures you of steady, profitable business.

In more than 17,000,000 American homes, Hotpoint appliances have served faithfully and with utmost efficiency. For over 40 years the Hotpoint trade-mark has been regarded by American families as the very symbol of dependability. Here is a symbol of merchandise value, quality and prestige that will add strength and protection to your present and future business investment.

We ask for your patience and cooperation in supplying the immediate needs of your customers. Shipments of Hotpoint products will be made on a fair and equitable basis to all Hotpoint selective dealers in all sections of the country as quickly as production facilities permit.

Edison General Electric Appliance Co., Inc.
5614 West Taylor Street, Chicago 44, Illinois

Hotpoint

Dependability Assured by 40 Years Experience!

Plans were also laid for a study course in lighting to be offered in cooperation with colleges and schools in the South, and plans were made for a series of articles on home lighting, postwar, to be offered the newspapers of New Orleans and vicinity.

SOUTHERN UTILITIES AMONG CONTEST WINNERS

Southern electric light and power companies were well represented among the winners in the Reddy Kilowatt annual report contest conducted by Reddy Kilowatt Service, of New York, N. Y. The contest is based on the belief that lively and understandable annual reports have inestimable good will value. Reddy Kilowatt has stressed the importance of giving stockholders appealing simplified reports, and that they can be dramatized and humanized in attractive ways without being humorous or cartoonish.

Although first place in the current award went to Puget Sound Power & Light Company, honorable mention was awarded to Carolina Power and Light Co., Raleigh, N. C.; Dallas Power & Light Company, Dallas, Texas; Kansas Gas & Electric Company, Wichita, Kansas; Mississippi Power & Light Company, Jackson, Miss.; and Southern Canada Power Company, Ltd., Montreal.

DALLAS ELECTS McCLURE TO NECA BOARD

The Dallas Chapter, NECA, has elected J. L. McClure, president of the McClure Electric Company, Dallas, as its member on the Board of Governors of National Electrical Contractors Association for 1945-1946.

Mr. McClure is taking the place of Robert Fischl, who resigned as Governor to take over the chairmanship of his Dallas Chapter Apprentice Training Program, in which he is greatly interested.

OFFICERS ELECTED FOR W. VA. ELECTRIC CLUB

The West Virginia Chapter of the National Industrial Service Association, known as The Electric Club, held a meeting on June 21st, when the following officers were elected: C. I. Bepler, chairman, Beckley Machine & Electric Co., Beckley, W. Va.; George Suppee, Jr., vice-chairman, W. Va. Armature Works, Bluefield, W Va.; Carl H. Brunner, secretary, W. Va. Armature Works, Bluefield, West Virginia.

The third Thursday of each month is the regular meeting time of The Electric Club. The place shifts from city to city, in order to promote the practice of shop visits.

OFFICERS ELECTED FOR JEFFERSON CITY NERA

Representatives from thirteen firms have organized a chapter of the National Electrical Retailers Association in Jefferson City, Mo. Officers elected were: Gene Schneider, Schneider Refrigeration Co., president; Milo Walz, Walz Furniture Co., vice-president; John Toennes, Woodman Engineering Co., secretary; Larry Schwiterman, Stokes Electric Co., treasurer.

NASHVILLE DISTRIBUTOR FOR EMERSON RADIO NAMED

Appointment of the Tafel Electric and Supply Company, Nashville, Tennessee, as distributor for Emerson Radio and Television sets has just been announced by W. W. Rosenfeld, sales manager of Emerson Radio and Phonograph Corporation, New York City.

The Nashville branch of the Tafel Electric and Supply Company was established in 1928, and has operated continuously since that time under the management of J. E. Hensley.

Carl W. Thomas is the merchandise manager and will act in the capacity of sales manager for Emerson radios. His wholesaling experience has equipped him with a practical understanding of merchandising and a full appreciation of dealers' problems. This distributor plans on having a well-rounded, highly capable sales organization to work closely with dealers now and in the postwar period to further the sale of Emerson radio sets.

STEWART-WARNER APPOINTS MIAMI DISTRIBUTOR

J. M. Keely Sales Company, Miami, Florida, has been appointed distributor of postwar Stewart-Warner radios in the Miami territory, it was announced by the radio division of Stewart-Warner Corporation. The territory covers the southern half of Florida. The company maintains a branch office and warehouse at Tampa.

Mr. Keely, president of the company, has been in the marine hardware and accessory business for 36 years, with headquarters at Tampa until 1942. The appliance division of his company, including radios, will be managed by Joseph H. Irvine, who joined the Keely organization a few weeks ago. Mr. Irvine had been with the Stewart-Warner factory staff since 1937, formerly in the Chicago distributorship and since 1942 as liaison

FLORIDA APPLIANCE CORP. OPENS NEW WAREHOUSE

The Florida Radio and Appliance Corporation, electrical wholesale distributors, has formally opened their new warehouse at 2320 Liberty St., Jacksonville, according to announcement by George B. Gray, vice-president.

This warehouse is one of the most modern in the state of Florida, being equipped with inside loading docks for trucks, sidings for rail transportation, together with modern offices and display rooms.

While headquarters for the Florida Radio and Appliance Corporation are at N. W. 5th St. and 1st Ave., in Miami, their operations in Tampa and Jacksonville are complete and the territories are handled by division managers.

In order to properly open this very fine Jacksonville warehouse, a general sales meeting was held, with the entire personnel present.

HERE'S a ductway which effectively withstands the corrosive action of all types of soil normally encountered in cable installation.

This advantage of Transite Ducts is shown in a series of tests conducted over a two-year period by an independent research agency. Through cinder fills, salt marshes, peat bogs, clay, loam and many other aggressive soils, laboratory men found that these asbestos-cement ducts actually became stronger, more durable with age.

As an added factor, underground cables encased in Transite are *cooler* cables because this inorganic material dissipates heat more rapidly than ducts with an organic content. Thus cable life is lengthened.

The permanently smooth bore of Transite Ducts makes long cable pulls easy and speeds up replacements. These ducts come in long, lightweight lengths, easy to handle and install.

* * *

For details, write for Data Book, DS410, Johns-Manville, 22 E. 40th Street, New York 16, N.Y.

JOHNS MANVILLE JM PRODUCTS

Johns-Manville

There is an office near you

TRANSITE DUCTS
CONDUIT for use without concrete
KORDUCT for concreting in

FEDERAL ELECTRIC PRODUCTS COMPANY, INC.
50 Paris Street, Newark 5, N. J.

Yes! . . . I want a copy of the FEDERALOG

Name and title.....

Company .....

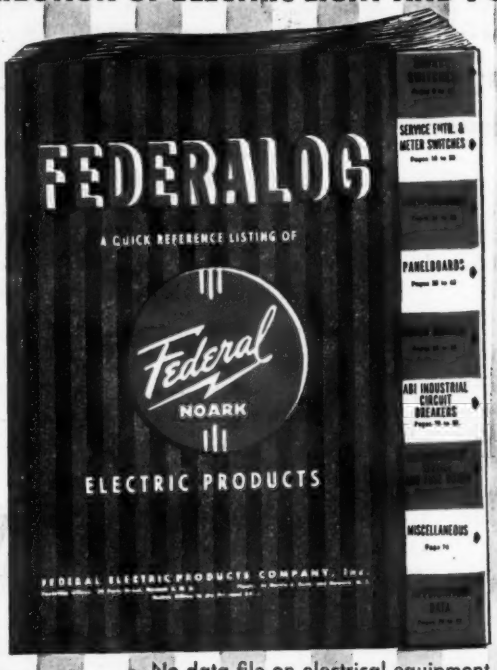
Address .....

☐ Please place my name on your mailing list for all future material

THIS COUPON WILL BRING YOU YOUR COPY OF THE

FEDERALOG

ONE OF TODAY'S MOST IMPORTANT CATALOGS ON EQUIPMENT FOR THE CONTROL AND DISTRIBUTION OF ELECTRIC LIGHT AND POWER



No data file on electrical equipment is complete without a copy of the FEDERALOG . . . a dependable guide to the newest developments in Motor Controls, Safety Switches, Circuit Breakers, Service Equipment, Panelboards and Multi-Breakers.

FEDERAL ELECTRIC PRODUCTS COMPANY, INC.

EXECUTIVE OFFICES: 50 PARIS ST., NEWARK 5, N. J. • PLANTS: HARTFORD, CONN. • NEWARK, N. J.

man between the factory and various war agencies concerned with priorities. His experience in the electrical appliance field dates back to 1917, when he became midwest manager for a vacuum cleaner manufacturer.

ELECTRICAL WHOLESALER HONORS RETIRING MEMBERS

At a dinner given by Joe R. Straus, president of Straus-Frank Co., at his home recently, Jesse L. Alburger and Albert Tolle were guests of honor in recognition of their having completed 50 years of service with the company. They will be retired with full pay.

The firm, one of the largest wholesalers of electrical, automotive and hardware appliances, parts and equipment, is this year celebrating its 75th anniversary, having been founded in 1870 as L. Frank & Co. The change to the present name was made in 1921.

In addition to the San Antonio store, the firm operates a branch in Houston, with Robert D. Straus, a vice-president, in charge.

STROMBERG-CARLSON APPOINTS DISTRIBUTOR

Southeastern Florida is the latest territory to be included in the future radio marketing plans of the Stromberg-Carlson Company. Clifford J. Hunt, manager of radio sales for the fifty-one-year-old Rochester, N. Y., communications firm, announced that the company had appointed the Domestic Refrigeration Company, of Miami, area distributor for the company's line of radio, FM and television receivers. The Florida firm, which also distributes Frigidaire Products, is headed by F. H. McDonald, president.

DISTRIBUTOR APPOINTED FOR STEWART-WARNER

Cruse Crawford Distributing Company, Birmingham, Alabama, has been appointed distributor of Stewart-Warner postwar radios in 53 Alabama counties, the radio division of Stewart-Warner Corporation has announced.

V. T. Fain, partner in the Cruse-Crawford company with J. D. Kirkpatrick, Jr., will be in charge of radio distribution and sales to dealers.

THOR LINE DISTRIBUTED BY B. F. GOODRICH CO.

The B. F. Goodrich Company will continue as a distributor of Thor products, manufactured by the Hurley Machine Division of the Electric Household Utilities Corporation, it is announced by C. T. Morledge, manager of the company's Auto and Home Supplies Department.

FOR THE FUTURE-MINDED DEALER . . . . . .

Economaster

APPLIANCES ELECTRICAL FOR YOUR CUSTOMERS' HOMES

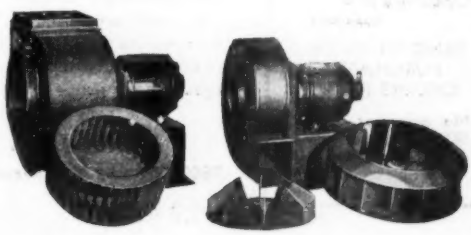
WRITE NOW FOR INFORMATION ON THE *Economaster* LINE . . . .

ADDRESS ECONOMASTER, DEPT. 129, GAMBILL BLDG., NASHVILLE 3, TENN.

Climate AS YOU LIKE IT

THAT'S the story behind Johnson's Health-aire propeller fans and blowers. The cumulative "know-how" growing out of more than twenty-five years of constant research and experiment back every one of these products.

Johnson Health-aire Propeller Fans and Blowers of various types are now available for industrial and commercial users. Let a Johnson engineer help you solve your ventilating problems . . . his counsel is available to you at all times.



Healthaire

JOHNSON FAN & BLOWER CORP.

H. C. BIGLIN, 177 HARRIS ST., N. W., ATLANTA 3, GA.

Chromy asks:

"Hunting for a Good Line?"

For all Electric Ranges

Rebuilding your business?
Reopening your business?
Opening a new business?

SEND IN YOUR PURCHASE ORDERS NOW

No priorities. No WPB Endorsements Needed.

For a top profit electric range unit replacement line you need look no further than CHROMALOX.

It's always a perfect fit when you replace with CHROMALOX *Superspeed* and *Heatflo* Units. The Snap-on Adaptor Rings do it . . . for CHROMALOX Adaptor Rings—installed in a jiffy—stay snug and tight.

A small inventory of *Superspeeds* and *Heatflos* plus inexpensive Snap-on Adaptor Rings, service all makes of Electric ranges. Less manpower, time and inventory *equals* more profit to you per call.

Edwin L. Wiegand Co.
7600 Thomas Boulevard Pittsburgh 8, Pa.

C. B. Rogers, 1000 Peachtree St., N.E., Atlanta, Ga.
L. R. Ward Co., 403 Southland Building Annex, Dallas 1, Texas; 932 M & M Building, Houston 2, Texas
W. R. Phillips, P. O. Box 2561, Raleigh, N. C.

on new ranges and for replacements

CHROMALOX

means Electric Cooking at its Best!

RC-8

New Dealers — New Lines

F. C. Peters, manager of the Linkway Store, Russellville, Ark., has announced his organization has contracted for the agency for the Westinghouse home freezer.

* * *

The Peoples Mercantile & Implement Company, of Earle, Ark., has announced the signing of a dealership contract with the General Electric Company through which it will handle the complete line of GE refrigerators and appliances.

* * *

Harold Ashley Co. recently opened offices and show rooms at 802 Hogan St., Jacksonville, Fla.

Harold W. Ashley, Jr., of the new firm, announced that his company has been appointed dealer for many nationally known electrical appliances. Many items are already on display and many more are on the way. The full line, however, will not be available until after the lifting of all war restrictions.

Mr. Ashley has been a Jacksonvillian since 1935 and has been engaged in the electrical appliance business. He was president of the Junior Chamber of Commerce during 1943-44, and was granted the United States Jaycee Distinguished Award upon his retirement. He is a captain in the Civil Air Patrol.

* * *

The Electrical Appliance Store, R. A. Chapman, owner, will open soon in the former B.&B. Grocery store next door to the post office in Frostproof, Fla. Already it is being reconditioned and modernized.

Mr. Chapman announces that he will handle a complete line of electrical appliances. His store will also house a complete service department.

* * *

William Searles, of the Searles Radio Shop, 824 Las Olas Boulevard, at Ft. Lauderdale, Fla., has been appointed General Electric dealer for this area.

To accommodate his expanding electrical trade, Searles has plans drawn for a modern two-story building for postwar construction. It will feature a drive-in-while-you-wait for his customers.

* * *

The J. M. Keely Sales Company, Miami, marine hardware and equipment firm, is perfecting plans for the distribution of household electrical appliances. Arrangements already have been made for the handling of Stewart-Warner radios (marine and

home types) and Conlon washers and ironers. And negotiations now are under way for the inclusion of electrical range, water heater and domestic refrigerator lines. The concern distributes, also, Onan (D. W. Onan & Sons, Minneapolis) electrical generating apparatus, marine, stationary and portable.

J. H. Irvine, formerly with Stewart-Warner Corporation, has joined the Keely Sales staff, as manager of the electrical appliance division. The company's display facilities, at Miami, for this type of merchandise are especially good. The firm, headed by J. M. Keely, president, has a Tampa location, also.

* * *

Thor washers and Thor ironers are now on display in Kansas City at Dascomb-Daniels Lumber Company and at the Katz Drug Stores. Each dealer was accepting signatures on their priority registers for delivery of a limited number in the next twelve weeks. Displays went on August 19.

* * *

Wright Appliance Company, Kansas City, which is planning to operate a chain of appliance stores in several states, using Kansas City as a business base, has a new modern glass front on its Kansas City location — a front which may be adapted for use on all its stores.

* * *

General Refrigeration Corporation has started construction of a new $35,000 building at Waynesville, Mo., where it will produce electric refrigerators. Sam Robins, a representative of the corporation, said they had more than two million dollars in advance orders. The plant will employ 300 persons.

* * *

Home Equipment Stores, Kansas City, Mo., now has possession of all of the three-story building at 1225-27 Walnut Street, after occupying a part of the first floor since they leased the building a year ago. The building will be remodeled and completely open for business September 15, with displays of appliances and furniture on all three floors.

This firm operates a similar store at 921 Minnesota Avenue, Kansas City, Kansas.

* * *

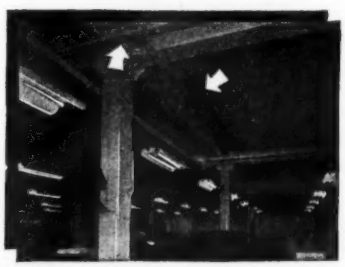
Display room and parts and service departments will be features of the new two-story building leased by Schwander Appliance Company, 3914-20 Olive Street, St. Louis, Mo. The building is being remodeled for the company which is a distributor for Crosley radios and refrigerators and other electrical appliances.

ANNOUNCING WIREMOLD BUSINESS-BUILDERS

"HOW TO USE IT" Competition

• REALLY WORTHWHILE PRIZES •

TYPICAL EXAMPLES OF WIREMOLD INSTALLATIONS THAT COULD • WIN FOR YOU •



• 1ST. PRIZE . . . $500.00
• 2ND. PRIZE . . . $250.00
• 3RD. PRIZE . . . $100.00

$25 PAID FOR ALL ENTRIES USED IN WIREMOLD PROMOTION

OPEN TO ALL CONTRACTORS AND ELECTRICAL MAINTENANCE MEN

Today... and in the near future... you are planning many jobs using Wiremold Raceways and Fittings in war plants, hospitals, schools, stores, offices and other types of buildings. All of these jobs are interesting to us and many of them will point the way to future Business-Building opportunities for you and your fellow electrical men. That is why we are announcing this Wiremold "How to Use it" competition... to record the best of these Wiremold applications for the benefit of all. Send now for folder giving full details of how to enter, and the few simple rules.

Awards will be made for those installations judged as showing business-building possibilities in a wide field, as well as good judgment in the selection and use of our products, bearing in mind the wide adaptability and interconnectability of Wiremold in completing the wiring system "FROM PANEL BOXES TO OUTLETS".

The judges shall be chosen from the electrical industry, and their decisions shall be final.

COMPETITION OPENS OCT. 1, 1945
...CLOSES APRIL 1, 1946

THE WIREMOLD COMPANY, HARTFORD 10, CONN.

The MORE YOU KNOW

. . . about the fuses you sell . . .

The MORE YOU'LL SELL!

THE NEW ROYAL-NOARK *Non-Renewable* FUSES ARE 5 WAYS BETTER

. . . . A NEW DESCRIPTIVE CATALOG EXPLAINS WHY

Write for your copy *TODAY*, and ask to have a ROYAL man call!

ROYAL

WIRE • CORD SETS • CARTRIDGE and PLUG FUSES • FUSTATS • TROUBLE LIGHTS • CHRISTMAS LIGHTING SETS

ROYAL ELECTRIC CO., Inc., PAWTUCKET, R. I.

News About People

The consolidation of the Westinghouse Electric Corporation advertising programs under direction of J. M. **McKibbin,** assistant to vice-president including all general advertising, t radio programs, motion pictures a sign identification work, has been a nounced in Pittsburgh by George H. **Bucher,** president.

Mr. McKibbin has had charge o company product and industry a vertising since May, 1944. Assig ment of the additional advertising r sponsibilities to Mr. McKibbin plac the entire Westinghouse progra under his direction. His office w be in Pittsburgh.

A native of Pittsburgh, Mr. M Kibbin joined Westinghouse in 192 as a member of the promotion d vision in Pittsburgh. Since that ti he has been advertising manager the company's offices at Clevelan Ohio, Detroit, Mich., and the ce tral district with headquarters in Pitt burgh; head of promotional oper tions of industries served by We inghouse; apparatus promotion ma ager; in charge of the Applicatio Data & Training Section, and in 194 was made assistant to vice-presiden He was awarded the Order of Meri the company's highest award to em ployes for outstanding work, in 194

* * *

Sangamo Electric Company, Spring field, Ill., pioneer manufacturers watthour meters, meter accessorie and time switches, announces the a pointment of **James H. Patton** as sal manager of the Utilities and Indu trial division, and **L. Dana Johnson** sales promotion manager.

Mr. Patton was, for many yea Southeastern district manager, pri to that having held similar positio in the middlewest and southwest te ritories. Upon Sangamo's entry int the war effort, Mr. Patton was r called to the factory to assume re sponsibility for the production of con fidential naval apparatus. He will con

L. D. Johnson **J. H. Patton**

tinue in this capacity until late fall, when he will take on his new duties.

Mr. Johnson, whose association with the Sangamo sales department has been long and varied, steps into his new position from that of assistant sales manager. Until absorption of a former Sangamo subsidiary, the Lincoln Meter Company, Mr. Johnson managed this company's affairs. His past experience includes an eight year stay in the Orient, representing Sangamo interests.

* * *

Henri Sadacca, president, announces the appointment of **Joseph H. Ward** as executive vice-president of the Noma Electric Corporation. Mr. Ward joined the Noma organization in 1927

J. H. Ward

and after passing through various departments in the company was placed in charge of sales and distribution and made a director of the company in 1938. Prior to joining the Noma organization, Mr. Ward was associated with the Lamp Division of the General Electric Company. For the past 25 years he has been actively associated with the electrical supply and toy business.

* * *

E. J. Garrigan, formerly vice-president and factory sales manager, has been appointed vice-president in charge of sales and will be responsible for directing all sales activities of The Okonite Company and its Hazard Insulated Wire Works Division, as well as those of its affiliate, The Okonite-Callender Cable Co., Inc. Mr. Garrigan, also a director of the company, has been connected with the electrical wire and cable industry for over 40 years.

C. E. Brown, Jr., formerly vice-president in charge of the company's Washington, D. C., office has been appointed vice-president and general sales manager to coordinate the activities of the executive offices in Passaic, N. J., with the company's 18

TOP QUALITY POULTRY HOUSE TIME CONTROLS

Model PS

Model 301

TO insure Fall delivery place your order now for Paragon Top Quality Poultry House Time Controls. Paragon "PS" models are designed for both morning and evening lighting, with dimming period for roosting. The Paragon Model 301 is designed essentially for morning lighting only. It is a heavy duty, industrial type time switch adaptable to poultry house lighting. It is truly a superior instrument of high quality and low price. All Models are synchronous motor operated and available . . . Without priority ratings.

Send for Authoritative Bulletin

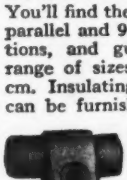
Paragon has prepared a 4-page, 2 color bulletin containing authoritative information relative to poultry house lighting control . . . location of lights, selection of light control switches, etc. It summarizes the recommendations of leading poultry authorities and gives complete data regarding the wide range of Paragon poultry house time switches... Also, attractive envelope stuffer available in quantities for your distribution.

PARAGON ELECTRIC COMPANY
713 Old Colony Building
Chicago 5, Illinois

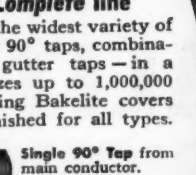
Paragon Chicago
BUILDERS OF ELECTRICAL EQUIPMENT SINCE 1905

It's Easy to pick the right CABLE TAP— from the *Complete* line

You'll find the widest variety of parallel and 90° taps, combinations, and gutter taps—in a range of sizes up to 1,000,000 cm. Insulating Bakelite covers can be furnished for all types.

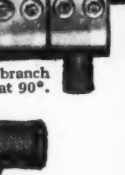


Single 90° Tap from main conductor.



Combination Tap, one branch parallel to main, one at 90°.

2-Way Gutter Tap.



Bakelite Covers can be furnished for all types of Penn-Union cable taps.

3-Way; continuous main and two separate branches.

Also a complete line of Service Connectors, Terminals, Tees, Straight and Parallel Connectors, Grounding Connectors, etc.—every good type of conductor fitting. And every one is accurately made, thoroughly tested —*dependable.*

L. MORRIS LANDERS
315 Walton Bldg. ATLANTA, GA.
WALTER J. HUEMMER
Dallas Transfer & Terminal Warehouse Bldg. Dallas, Tex.
PENN-UNION ELECTRIC CORPORATION
Erie, Pa.

PENN-UNION
Conductor Fittings

branch offices. Mr. Brown, who will have offices at Passaic, N. J., as well as in the New York district sales office at 501 Fifth Avenue, has been connected with the Okonite sales organization since 1919.

* * *

Walter J. Barnes has been appointed Southern District sales manager of the National Electric Products Corporation, Pittsburgh, Pa. This announcement was made by **W. C. Robinson, Jr.,** vice-president of the National Electric organization.

Mr. Barnes returns to the company to assume this new post after being in the Pacific theater of war for several years as a lieutenant commander in the Navy. He will make his headquarters at the National Electric offices, 168 Walton St., Atlanta, Ga.

* * *

Greenlee Tool Co., Rockford, Ill., has recently announced the appointment of **Philip E. Chappel** as factory representative for the territory previously covered by **Charles L. Clark,** who has retired from field work to assume duties at the home office.

Mr. Chappel works out of the home office, covering the territory extending from Lake Superior to the Gulf of Mexico, and from Rockford, Ill., to Denver, Colo.

* * *

James F. Whitehead, Jr., industrial lighting engineer for Georgia Power Company, has resigned that position to become manufacturers representative for Day-Brite Lighting, Inc., St. Louis. Mr. Whitehead has established offices at 423 C & S Bank Building, Atlanta. His territory will include Georgia, Alabama, and East Tennessee.

Following attendance at Georgia Tech, Mr. Whitehead started work with Georgia Power Company in the distribution department in 1929. He was transferred to the lighting division in 1934, and served for a while as commercial lighting representative at Athens. In 1936, he was transferred to the general office, at Atlanta, as a commercial lighting specialist. In this capacity he worked with architects and engineers in the design of lighting installations. An outstanding accomplishment was his important part in designing the lighting system for the vast Bell Aircraft plant at Marietta, Ga. He was loaned to Robert and Co., Inc., for this work, and while on a similar loan status, he designed the lighting for the Navy Hospital, at Dublin, Ga.

* * *

Ellis Knox, head of the electrical inspection department of Miami, Fla., recently completed a six-week course on electronics at Marquette University, Milwaukee, Wisc. In a talk before members of the Florida Engineering Society and the Southeast Florida Professional Engineers Association, given after his return to Miami, Mr. Knox forecast a vastly broadened employment of electronic devices in industry. The production of electronic apparatus and materials, he pointed out, already is a four-billion-dollar business.

J. F. Whitehead, Jr.

HELWIG SPEER
Carbon Products

Multiflex Brushes
Give
Better Commutation
Longer Life
Less Commutator Wear
That Extra Demand Required
Better All Around Performance
KEEP THE BONDS YOU BUY

HELWIG COMPANY
2544 NORTH 30th ST., MILWAUKEE 10, WIS.
Southern Offices:
323 Northwest Second St.,
Oklahoma City 2, Oklahoma
3000 Block McKinney, Houston 3, Texas
1913 Washington Avenue, St. Louis 3, Missouri

Verlyn H. Branham and **J. Paul Lumpkin** have formed a partnership, effective Sept. 1, to be known as Branham and Lumpkin. They will represent manufacturers throughout the southeastern states. Mr. Branham has been in the manufacturing field

V. H. Branham J. P. Lumpkin

of the electrical industry for the past 20 years. Since the first of this year he has represented several manufacturers.

Mr. Lumpkin has been representing electrical manufacturers for a number of years and for the past five years has been associated with The Bryant Electric Co., with headquarters in Charlotte, N. C., where he will continue to live.

Branham and Lumpkin will represent the following manufacturers: Walker Electrical Co., Atlanta, Ga.; Western Insulated Wire Co.; Sangamo Electric Co.; Ilsco Copper Tube & Products, Inc.; Hub Electric Company, and Gardner Manufacturing Co

* * *

With a belief that a change of climate will materially improve both his own and his family's health, **H. G. Williams**, superintendent of operations, has resigned his position with the Electric Power Board of Chattanooga, Tenn., effective August 15. **E. C. Williamson**, system operator, has been advanced to the position of superintendent of operations and will assume the duties and responsibilities formerly carried by Mr. Williams.

J. J. Renan, chief load dispatcher, will assume the duties and responsibilities as system operator. Supervision of the dispatchers and troublemen will be consolidated with the responsibilities of the system operator.

E. C. Williamson J. J. Renan

Take a TWO-WAY LOOK AT THE Monarch Fuse

LOOK NO. 1

the MONARCH SUPPORTING BRIDGE

Note how this Monarch construction prevents the fibre bar from coming in direct contact with the screw connecting renewal link to knife blade. This minimizes the charring of the fibre bar and positively prevents excessive overheating of knife blades. Note also large metal parts which dissipate heat. Result: *dependable protection.*

"Look No. 1" illustrates this construction in a lighter-duty Monarch knife-blade fuse and "Look No. 2" shows adaptation of this principle in a heavy-duty model.

LOOK NO. 2

the FERRULE TYPE

Specify Monarch Fuses *for improved* FUSErvice

Monarch RENEWABLE Fuses

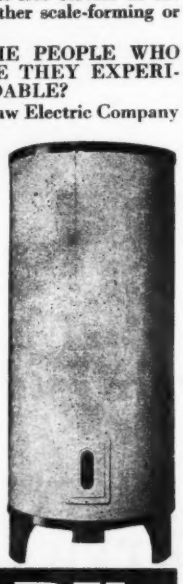
MONARCH FUSE CO., LTD.
118 E. FIRST ST., JAMESTOWN, N. Y.

THINKING ABOUT

—THEN DON'T FORGET, MR. DEALER, THAT YOUR PROFIT DEPENDS ON SELLING A WATER HEATER THAT *GIVES* SERVICE—NOT ONE THAT *DEMANDS* SERVICE

In planning for profitable merchandising of water heaters it is vital that you select a heater that will give your customers long, completely satisfactory service and assure YOU freedom from costly repair and replacement expense. In choosing an electric water heater, here are three questions you will want answered:

1. IS IT A TRIED AND PROVED PRODUCT
   Answer: The Clark was the pioneer storage electric water heater more than twenty years ago and has been manufactured continuously ever since. Many of the original Clark heaters are still in daily service.
2. HOW WILL IT STAND UP IN HARD OR SOFT WATER?
   Answer: Because of the famous Clark "Lifesaver" element and its unique heating principle Clark heaters will give longer, more trouble-free service in the toughest kind of either scale-forming or corrosive water.
3. HOW ABOUT THE PEOPLE WHO MAKE IT — ARE THEY EXPERIENCED, DEPENDABLE?
   Answer: The McGraw Electric Company name on the Clark heater is your guarantee of honest value and fair dealing. Check it any way you like, you will find the name and product dependable.



A CLARK FRANCHISE FOR YOUR TERRITORY MAY STILL BE OPEN. WRITE FOR FULL DETAILS.

McGRAW ELECTRIC COMPANY
CLARK WATER HEATER DIVISION
5201 W. 65th Street, Chicago 38

CLARK
ELECTRIC WATER HEATERS
A Toastmaster Product

George S. Patterson, of St. Petersburg, Fla., has joined the Monitor Equipment Corporation, a newly organized company. It will handle sales of electrical appliances and will be in charge of all Florida. Patterson formerly headed the Florida sales organization of the General Electric appliances.

"The Monitor Equipment Corporation," said Mr. Patterson, "has been organized to provide a market for the hundreds of small plants engaged in the manufacture of electric appliances, which have grown into comparatively large plants, through war contracts."

Wave Windings For A-C Motors

(*Continued from page 66*)

tom, the lead groupings will be R2, A2, R1, A1; R4, B2, R3, B1; and R6, C2, R5, C1. Or reading from left to right, clockwise around the winding, the A1, B1, C1 leads will head each group for the two cases of counterclockwise windings, the R2, R4, 4* leads will head the groups.

The next step in constructing the diagrams is the location of the B1 lead slot, and this will be discussed in the next article, together with rules for lead spacings.

All-Electric Kitchen Promotion Plans

(*Continued from page 60*)

years. They will be able to finance kitchen remodeling into the real estate mortgage. Such additions to present mortgages need not increase the monthly payments in many states, since the valuation of the property is usually enhanced more than enough to assume the additional loan.

Some dealers frown on including appliances and furnishings on home mortgages. Their objections are based on the disadvantages of the long-term arrangements resulting in the large amount of interest ultimately paid on the appliances when they are carried on 10 or 20 year mortgages. However, several savings and loan group plans, as well as loans under FHA regulations, permit inclusion of most household appliances as part of the real estate in a majority of the states.

Where long term financing is planned, care should be exercised to avoid conflict with existing state mortgage laws.

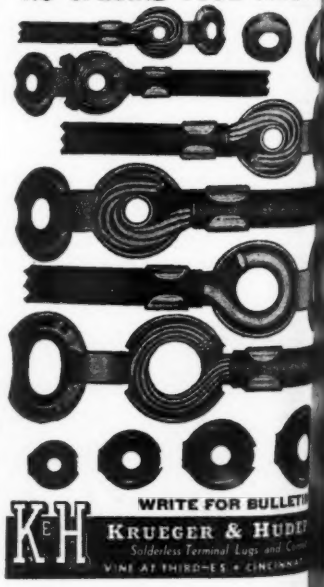
The amount that can be invested prudently for this type of improvement has been arbitrarily set at 10 per cent of the valuation of a single family dwelling. This includes sink and cabinets that would be included in new homes otherwise unfurnished.

In four apartment buildings, the improvement would be figured at approximately nine months gross rental. For example: for investment purposes, in remodeling a $5,000 home, the equipment that could be wisely installed would be a standard electric refrigerator and range at $140 each; a cabinet sink at $70; and three base cabinets and three wall cabinets at $20 each, for a total of $470. All prices are retail list, based on 1942 prices, which should not greatly differ from postwar prices.

The equipment suggested is not the lowest cost available, but is standard quality merchandise.

Monthly Payments

To finance an installation such as the above: suppose the owner paid in 24 payments, the monthly payment would be $19.74 with $47 or 10 per cent paid down at time of purchase. A 30 to 36 month plan would reduce the monthly payments proportionally. If an owner wanted to add to his house mortgage, he should see his lending agency concerning re-writing his loan, or other steps to meet dealer's terms and state regulations.



The cost of equipment for an average complete home laundry would total around $400, figuring the washer (conventional) at $80, the table-top ironer at $100, the electric tumbler dryer at $140, and two base cabinets and two wall cabinets at $20 each.

Apartments that rent for $50 per month, or homes, valued at $5,000, with large kitchens popular in millions of dwellings built before 1924, can be remodeled to make the kitchen a "triple-duty room"—with combination electric kitchen, complete home laundry, and a snack bar separating the two for a total approximating $1,000. Such highly functional arrangements will add greatly to livability and the total investment is in line with the property evaluation. In homes of valuations above $7,500, the complete kitchen investment can prudently include an automatic dishwasher and disposall in an all "electric cabinet-sink." This work-saving combination retails for approximately $350.

Electric utility companies in many areas have a 1 cent per kwh charge for electricity for automatic water heating. Because new type clothes washers, as well as automatic electric dishwashers, require ample supplies of properly controlled temperature water, the table-top cabinet automatic storage electric water heaters are being planned into many modernization projects. A constant supply of hot water is essential in any home using automatic washing equipment.

Fluorescent Lamps For the Home

(*Continued from page 41*)

An additional breakfast alcove fixture, mounted on the wall, throws ample light on the table and gives a pleasant dining atmosphere to the room, when used independently.

Ideal illumination for shaving, applying make-up and dressing is a feature of the model bathroom. Fluorescent lamps and fixtures are used throughout. The compact ceiling fixture, an experimental model illustrating the trend of postwar designs in such utility areas, gives the entire bathroom a soft, cool and shadowless light which creates an atmosphere of cleanliness. Lamps on either side of the mirror provide excellent illumination for shaving or applying make-up because the long lines of light reach from the top of the head to below the chin, thus eliminating the shadows usually created under the chin. These lamps are mounted on separate outlets, but a similar arrangement is possible where only one outlet exists.

The PLAN Behind The PRODUCT!

Vaculator

PROTECTED Profits!
Aggressive PROMOTION!
Distinguished DESIGN!

Vaculator
the NAME WOMEN KNOW!

Liven housewares sales with this consumer-accepted "best seller"! Fair-traded for FULL profits, backed by potent advertising in leading magazines, made with PYREX brand glass—and priced LOW to sell QUICKLY.

IN A CLASS BY ITSELF!
purtch CLOTHLESS FILTER
The *biggest* "LITTLE" thing in coffee makers! Can't fall out; no cloth or paper; virtually unbreakable; fits ALL standard makes. It's *R-E-D HOT!*
50¢ LIST

FREE!
DISPENSER
STOPS the prospect; TELLS the story; MAKES the sale!

VACULATOR · CHICAGO 6, U.S.A.

Write for your free copy of the Pedigree Insulating Varnish Catalog

THE P. D. GEORGE COMPANY

5200 N. 2ND ST., ST. LOUIS, MO.

Surplus Security
for
YOUR
LAMPS

McGILL
LAMP GUARDS . . . .
designed for Double Duty

Thousands of industrial, commercial and home users are finding the McGill Lamp Guards provide their lamps with surplus security—by performing the double duties of light and safety protection.

Made of heavily tinned steel wire, McGill Loxon (Locking) Lamp Guards and Gripon Non Locking Guards afford excellent protection against breakage, fires and theft. Gripon Guards are attached with plain steel screws. Both are supplied in sizes to fit all sockets and for regular and mill type lamps.

Protector "O" Guards are designed for heavy duty use in general construction work. Tough and durable, they are hard to crush or break and may be easily moved from job to job.

Ask for Catalog No. 43. Lists complete facts about these and other McGill electrical specialties.

McGILL
MANUFACTURING CO., Inc.
Electrical Division
VALPARAISO, INDIANA

Incorporating a number of interesting developments in residential lighting, the living room of the Lighting Center offers a variety of ideas for decorators and architects. Comfortable, home-like atmosphere and good light for reading, sewing, or card-playing is the keynote. Concealed behind the window valance, fluorescent lamps make a focal point of the window by highlighting the draperies, thus giving the room its principal decorative interest.

Portable incandescent lamps placed beside each seating unit furnish extra light for close work, while a decorative fluorescent ceiling fixture supplies soft general illumination over the entire room. Also, by lighting the rug and walls, the central figure eliminates the harsh light contrast that would exist if only the incandescent lamps were used for reading or sewing.

Successful blending of the two sources of light results in subtle shadows which are part of the decorative pattern, rather than sharply lighted areas and dark corners. When portable units are turned off, the fluorescent lighting on the ceiling and at the window gives a soft, attractive, conversational atmosphere to the room.

General illumination in the studio bedroom comes from fluorescent lamps enclosed in a lacy ceiling fixture, from fluorescent lamps concealed behind the window valance, and from fluorescent lamps above bookcase. Designed especially for a college or business girl, or as a guest room, furnishings and lighting are keyed to comfort and utility. Each of the three fixtures utilizes the light reflection value of the light colored, blue and white walls and white ceiling which help redirect the light over the entire area.

When only the valance light is in use the room has a pleasant, conversational atmosphere ideal for entertaining, while with any two of the fixtures turned on, there is sufficient light for studying, reading or sewing.

The lighted bookcase with fluorescent lamps above the upper and lower shelves, achieves an unusual decorative effect which could be employed in a living room, foyer, or study, as well as in a bedroom. Faint highlights enter the center shelf through a frosted glass panel and further drama is created through the use of different colored lamps—daylight in the lower shelf and white in the upper shelf—to change the appearance of the wood and accessories.

Lighting variations possible in a small area are illustrated in the study-type office at the Center. A louvered fluorescent ceiling fixture carries out the line of the conference table in the center of the room. It provides both indirect general illumination throughout and good working light on the desk itself. When special effects are desired, a shielded fluorescent strip behind the desk softly illuminates the draperies. The directional effect of sunlight is created at night by the use of another fluorescent strip placed on the ceiling in front of the glass brick window panel.

"The average person generally overlooks the importance of light in creating and inviting appearance throughout the home," Mr. Rooney remarked. "Actually, the whole effect comes from the color tone of the illumination, for it is the light reflected from a surface that causes the color impression registered in the eye. By changing the color tone of the illumination the whole mood or atmosphere of a room can be changed."

Garages Need Better Lighting

(*Continued from page 37*)

with a high bay in the center. The distance from this to the floor is 36 ft., while that of the rest of the ceiling is 18 ft. The overhead lighting installation consisted of 24 fixtures equipped with dome reflectors and

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clear glass lamps. A few of the latter were 500 watt but most of them were 300's.

The floor space under the high bay is used, for the most part, as a lane for handling shop "traffic". Therefore, no special lighting is necessary. Therefore, no change was made in the fixtures located in this portion of the ceiling, but all lamps, regardless of wattage, were replaced by frosted 500's.

For all other overhead lighting, fluorescent fixtures, similar to those used at the Northside shop, were substituted for the old fixtures, and were spotted at a like distance from the floor and from each other. Consequently, lighting was brought up from practically zero in some areas to a uniform 25 foot-candles, as planned.

A yard, adjoining the structure on one side, and containing bus-washing and cleaning facilities also lacked suitable illumination. This Ingalls provided by installing 9 floodlights, 6 of which were wall-attached. The others were pole mounted.

Much of the conduit and wiring previously installed was usable, and only a few extra plug-in receptacles were needed. However, new No. 12 conductor in sizable quantity was required for additional lighting circuits. "Distribution" was expanded, too, by adding two 12-circuit panels to the two 24-circuit panels already in use.

Another change made was the consolidation of two separate "services." One of these was single-phase, while the other, brought in later, was three-phase. The latter Ingalls removed. Pulling in extra wire, he converted the current supply to a 3-phase, 4-wire system, providing greater current flexibility.

Power Cost Reduced

When the installations were finished at the central shop, the utility made a current-consumption test at both locations. Based on the findings of this checkup, the bus company found that it, now, was scheduled to save an average of $120 per month on its light-and-power bill.

"The way we figure it," Freeman of bus company asserts, "the money we spent in revamping our shop electrical systems represents an investment which pays off in double dividends. For one thing, improved lighting and power facilities have raised the working efficiency of our maitnenance personel at least 65 per cent. For another thing, the project is self-liquidating through power-cost savings, alone."

As concrete evidence that Miami Transit feels it received good value for its electrical-overhaul dollars, the firm

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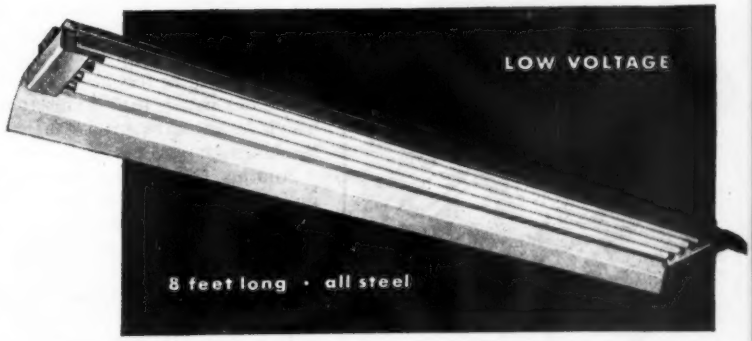

Here is the new Colovolt industrial fixture, one of a complete line of industrial and commercial "packaged" units. Equipped with the standard 93" Colovolt 10,000 hour lamp, Colovolt fixtures may be used singly or in continuous line lighting in multiples of 8 feet. Instantaneous starting, no flickering, guaranteed for 1 year except for failure due to breakage are extra advantages of the Colovolt Cold Cathode low voltage fluorescent lamp. The long life expectancy of Colovolt lamps may be realized even when constantly turned on and off, and *pre-scheduled re-lamping, with no loss of production or time, is now possible with Colovolt installations.*

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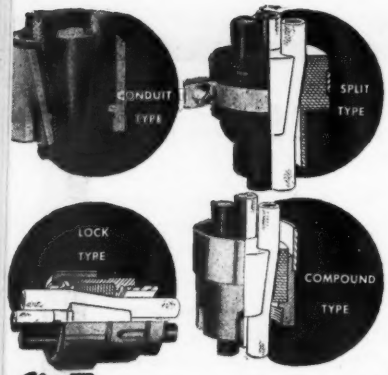

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CONDUIT TYPE CABLE SUPPORT for regular installations. Consists of a malleable iron body which is screwed on the conduit in place of the iron bushing and a wedging plug for gripping the cables.

SPLIT TYPE CABLE SUPPORT for use where cables are already installed. It consists of a two piece body held together by a steel band and the plug for gripping the cables.

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Conduit Fittings
Cable Terminators
Cast Iron Boxes
Solderless Connectors
Grounding Devices
Power Connectors

LOCK TYPE CABLE SUPPORT for supporting cables in a conduit in any position. A locking device secures the wedging plug to insure against loosening.

COMPOUND TYPE CABLE SUPPORT consists of a regular type support fitted with an extended collar to provide a compound chamber for sealing the end of the conduit

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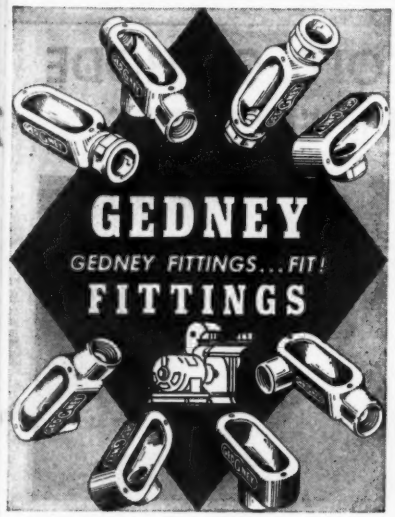

GEDNEY Conduit Bodies and Fittings are available for every wiring need. Complete lines of both threaded and threadless fittings are included. All are carefully finished, protectively packed in metal-edge cartons, clearly marked for time saving on the job, GEDNEY fittings are Underwriters Laboratories approved. Write for catalog.

GEDNEY ELECTRIC COMPANY
RKO BLDG., RADIO CITY NEW YORK, N. Y.

has given Ingalls Electric a contract to install an identical power-and-lighting setup in a shop-addition now under construction at Northside. The new building will more than double the floor space now available at that location.

The obvious conclusion to be drawn from the above case-history is that the electrical contractor, who is thinking in terms of postwar business, will find ample opportunity for increased volume at the automotive service stations and repair shops in his immediate vicinity.

How to Light Food Stores

(Continued from page 35)

choosing the special lighting for fruits and vegetables . . . and they definitely deserve special treatment. The colors are so varied, and often vivid, that just "any" light won't do. Red, orange, yellow and yellow-green fruits or vegetables do not appear natural under standard daylight or white fluorescent lamps. Soft white fluorescent lamps give fair results, but a combination of fluorescent and filament lamps, or filament lamps alone, are often desirable.

The intensity of light should be sufficiently high to give pleasing accent to these colorful displays. The perishable nature of such goods requires that they be sold without undue delay.

Open fruit and vegetable displays can be effectively lighted by recessed, louvered reflectors. There are numerous possibilities for building lights into special displays. A continuous trough may be built above the display, about three feet above the table. Luminous panels may be inserted, on which location, or special prices may be shown.

Another class of treatment may be indicated by the construction of a sort of awning over the display area with lights concealed by the edge of the awning acting as a valance.

One of the simplest methods of lighting special displays of any kind is to mount reflector lamps in adjustable holders on columns, beams, or elsewhere, and direct the beam to the display. The 7,000 candle power of a 150-watt reflector spot lamp does an effective high-lighting job.

Meat Department

The meat display is usually given a feature location in a super-market or other grocery. This location can be made even more of a feature "spot" by careful arrangement of the lighting.

Meat display cases are usually fitted

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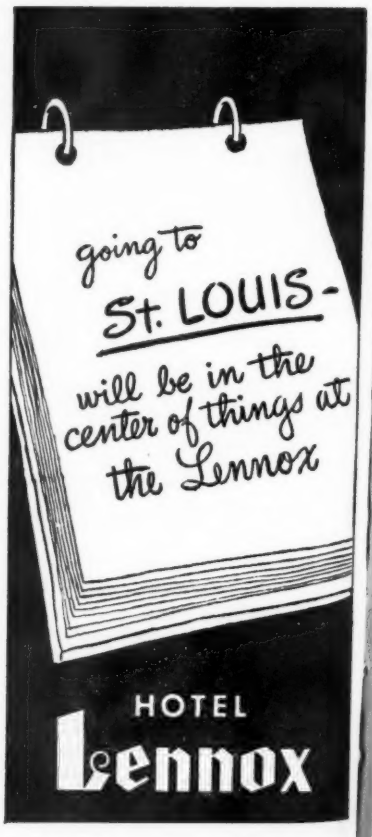

with lights either inside the case or along the top front edge on the outside. Inside case lighting should be of either fluorescent or cold cathode type so the heat input to the case from light will be a minimum. Light sources should be concealed from the direct vision of the customer.

Any one of the three types of light sources may be used in the outer reflector, but incandescent bulbs should be of the lower wattage types so that the exposed reflector will not become unpleasantly warm to the customer's touch.

Light of the wrong color will rob meats of their fresh red appearance and make fresh dressed chickens look less fresh. Poor choice of lighting colors places the meats and fowl in an unfavorable "light". Incandescent sources have color qualities which make them safe. Soft white fluorescent, which has a pinkish cast, is also favorable. This color is normally available in either the hot or cold cathode type. If the "hot" cathode fluorescent lamps are used inside refrigerated cases, the special type lamp which will start in low temperatures should be employed.

The meat department may be given added appeal by the arrangement of special high-lighted displays. These may be behind windows in the walk-in refrigerator, in the background of the department, or on the counter. Light will make each display a feature. In every case light from recessed spotlight or reflector lamp should be directed to that side of the display seen by the customers. It is occasionally practical to obtain feature lighting for the meat department by using a closer spacing of the store's general lighting system.

Spotlights, directed to each meat block, will give dramatic visual aid to the busy butchers.

Dairy Products

New types of open refrigerator display cases for dairy products are making their appearance. These open cases ease the lighting problem. A general lighting system of suitably high intensity (30 to 50 foot-candles) should provide adequate display lighting. Direct incandescent lights, however, will add sparkle to the display and give good color effect. Built-in fluorescent tubes should be of the "3,500-degree white" or other similar color combination.

Several locations in a food store are ideally suited for special displays. Such areas are at the crossings of main aisles, at the ends of aisles, or at the fronts of long rows of open double shelves. The best possible use of such

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EFFICIENCY CONDUIT HANGERS
for
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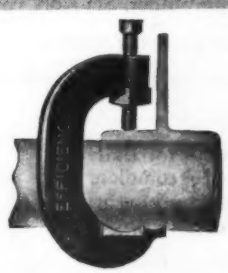

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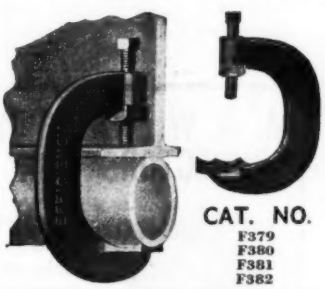

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For armored cable
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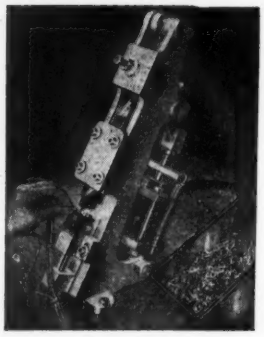

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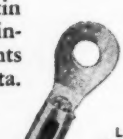

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spots should be made. The movement of the selected merchandise should be checked at frequent intervals, and the display changed if it is not effective. Of course, accent lighting is indicated for these areas. Reflector lamps directed to the front of the displays will do. Light sources should be concealed from the direct view of customers by covers or by some such means.

Checking Areas

Special lighting can be a real aid to the checker in efficiently performing his duties. High intensity lighting here will also minimize the customers' delay at this point—which is often the "bottle neck". Recessed lowered down-lights over each checking area will supply the desirable "punch" of light. Where recessing is impractical, a pendent fixture with a strong downward component of light will provide the desired effect.

The various service areas and stock rooms should be lighted with suitable industrial or commercial fixtures. It is well to have lights available wherever they may be needed, but assure economy of operation by providing individual controls.

Modern Lighting— Double-Duty Salesman

(*Continued from page 29*)

because of higher brightness. The higher the brightness, the more attention the merchandise will get. Hence, those who plan the layout for the modern commercial interior will not give every section of the store the same lighting levels. They will increase intensities for ordinary displays above the brightness of their surroundings, step up the lighting of special displays even more.

Utility, contractor, and wholesaler salesmen who hope to make the most of tomorrow's made-to-order market for commercial lighting equipment must guard against underselling. They must familiarize themselves with a rule-of-thumb footcandle ratio prescribed by the lighting experts for the various sections of retail interiors. In such circulation areas as wide aisles, lobbies, non-merchandising and segregated traffic areas, 20 foot-candles provide reasonably adequate general illumination. In all areas where merchandise is offered for sale, 50 foot-candles will do a good job. General displays, counter, wall and shelf areas, and complete high-traffic departments require lighting that attracts full attention, and here 100 foot-candles are prescribed. For feature displays of impulse and high-profit wares, as well as for emphasis on special merchandise, 200 foot-candles may be successfully used.

How To Achieve Lighting Goals

There are as many ways to achieve these lighting goals as there are men to plan better lighting for better selling. Effective attraction-lighting can be obtained from filament sources, spotlighting units or lamps, reflector or projector floods. Plug-in showcase units can help to produce effective eye-appeal. Current experience

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CONTINUE AVAILABLE
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THE M.&W. ELECTRIC MANUFACTURING CO., INC.
EAST PALESTINE • OHIO

indicates that it is feasible to employ combinations of different light sources in the same area in order to influence circulation through store sections with lower sales productivity.

Every planner of relighting layouts will be conscious of the difficulties presented by differences in color, weave, texture, finish, all involving display problems, and, consequently, lighting problems. Because of these differences, merchandise ranges from black material with 5% reflection of light, to light materials where the reflection factor is as high as 80%. Modern lighting takes account of these differences and helps to speed better buying, more accurate merchandise appraisal. As a result, it reduces returns which in some stores reach 1/8 of total sales.

As every electrical man knows, high levels of illumination alone do not assure a cheerful, modern atmosphere. Lighting equipment salesmen will study the brightness graduation for wall and ceiling that is an essential of pleasing atmosphere. There is a wide choice of new light sources, and effective combinations of these with old ones, that can help to induce customers to stay in the store longer, see and buy more merchandise, remember the store as a pleasant and comfortable place in which to shop. Lighting men may well study the use of fluorescent in colors and different ranges of white light which may be used to produce blends and shadings of atmosphere which subtly create desired effect. Lighting equipment salesmen may well note also the combinations of fluorescent with the punch of directional filament lamps for atmosphere as well as contrast and emphasis.

Atmosphere sums up and coordinates all the visible appointments of the store, the decorations, floor, wall and ceiling coverings, equipment arrangement and furnishings, and, to no small degree, the patterns of brightness that depend on lighting. All these add up to an effect that can be stimulating or relaxing, dignified or gay. Attractive and suitable atmosphere is valuable not only for effect on shoppers and personnel, but also because it definitely establishes the personality of the store. Obviously, the lighting should be geared to the type of merchandise sold and clientele served, and strictly functional ends can be combined with decorative effects.

When customers for relighting plan substantial remodeling or rebuilding, light can be employed as a new structural medium, to be harmonized with the overall effects and integrated with the architectural treatment.

Modern lighting, as an equipment salesman for the contractor and wholesaler and as a merchandise salesman for their retail customers, faces an unprecedented future. "Moving the sun indoors" is a job that calls for the best creative effort of everyone in the electrical industry. It is a job that demands the closest kind of cooperation between every allied industrial and business group.

The utilities and the lamp and fixture manufacturer, each in his own way, are making ambitious plans for educational and promotional campaigns, are completing a variety of effective and detailed sales aids Wholesalers, contractors, and electrical supply salesmen will have within easy reach the most modern, dramatic and potent sales ammunition.

How well will they use it? Certainly they will not fail to organize, demonstrate, and sell with the enthusiasm and vision necessary to cash in on the kind of market that has never existed before, that may never come again!

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NOW AVAILABLE! Churns whole milk. Thumb screw adjustment. Slight pressure adjusts or releases dasher to fit any 3 to 5 gallon container. Slow-speed, long-life motor prevents overheating. Better agitation produces more butter faster. Improved rust-proof dasher. New splash-proof plate. Improved design eliminates vibration. Easy to clean. Costs few cents a month to operate. Sold through trade channels only. From your jobber, or order direct. (Containers not sold.) Manufactured and Guaranteed by

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Every man concerned with motor rewinding will want a copy of this new publication by A. C. Roe which contains 72 modern connecting diagrams for induction motors of from 4 to 12 poles. The diagrams are arranged for dual voltage connections and best magnetic balance. A copy of this 132 page book is available with each 3-year subscription to Electrical South—total cost, $3. Write at once to

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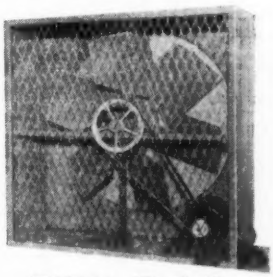
Portable – Quiet – Dependable – Safe



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This fan is of universal application either as an exhaust fan for commercial use or as a window fan.

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TEST STATEMENT—Each Reed Unit Fan bears a certified rating label of the Propeller Fan Manufacturers Association. This label certifies that the fan has been tested in strict accordance with the Standard Test Code as approved by the American Society of Heating and Ventilating Engineers.

Front View

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Manufacturers of Ventilating Equipment

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Experienced electrical men, familiar with low voltage distribution systems to act as sales specialists in important District Offices on following: Panelboards, safety switches, enclosed circuit breakers, bus duct and load centers. Men accepted to receive full training at factory at company's expense before assignment. Write to Supervisor, Technical Employment, 306 Fourth Avenue, Pittsburgh, Pennsylvania, for application form.

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WANTED

Superintendent for industrial electric motor repair shop, specializing in motor, generator, control and armature repair. Business located in South in fast growing industrial section town of 100,000. Prefer man with college degree and sufficient executive abiltiy to work approximately 30 employees. Good position with profit sharing incentive for right man. Reply giving full particulars, experience, educational background and salary expected. Address Box 605, care ELECTRICAL SOUTH, Grant Building, Atlanta 3, Georgia.

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National manufacturer of lighting equipment needs the services of engineers for the design and development of lighting transformers, capacitors, and reactors.

There are openings for application design engineers on Industrial, Commercial, and Street Lighting Equipment. Address Box No. 603, Electrical South, Atlanta, Georgia.

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Firm operating large small-motor shop wishes to expand in large motor field; has excellent opportunity for a man of at least 10 years' experience on elevator armatures and 3-phase motors; must be first-class troubleshooter, able to wind anything himself and capable of instructing and managing others as department expands. Large motor shop is bright and airy and already fully equipped; has drive-in from street. We have an unusual opportunity for a first-class man who can stand investigation; no drinkers or drifters will be considered; job is permanent and pays good wages. Write fully, giving your complete record in order to receive consideration. ELECTRIC EQUIPMENT CO., 2473 Sherman Avenue, N. W., Washington 1, D. C.

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If in need of aggressive sales representation with twenty years' acquaintance in the Hardware, Electrical and Department store field in Texas, Oklahoma, Arkansas, Louisiana, Mississippi and Memphis, Tenn., on Commission basis. Write today, Box 607, ELECTRICAL SOUTH, Grant Building, Atlanta 3, Georgia.

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Firm operating large small-motor shop has excellent opportunity for men experienced on small motor work; permanent positions, paying good wages. Write fully, giving your complete record in order to receive consideration. ELECTRIC EQUIPMENT CO., 2473 Sherman Avenue, N. W., Washington 1, D. C.

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SMALL MOTOR - - - - - - - —ASSEMBLERS
SMALL MOTOR - - - - - - - —TESTERS

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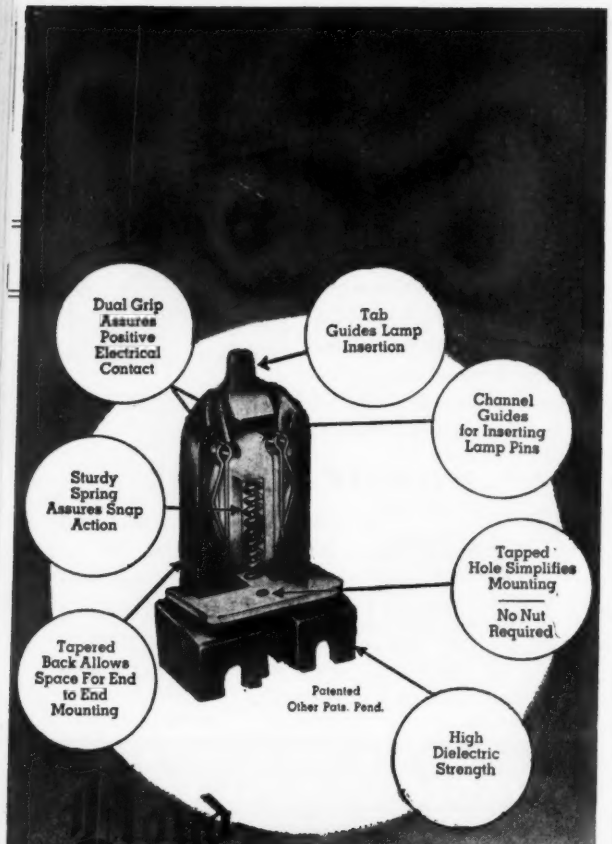
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